American Aviation

The Independent Voice of American Aeronautics

15c A Copy

Vol. 5, No. 12 NOVEMBER 15, 1941 Published Twice a Month at Washington, D. C.

Revised Neutrality Measure To Boost U. S. Oceanic Flying

Military Plans Envision Navy's Adoption of Export, Closer Linking of Army to PAA, as Emergency Steps

REVISION of the neutrality law will clear the runways for Freedom of the Air as well as Freedom of the Seas by opening all the world to both military and commercial aircraft flying the American flag.

Air convoying of merchant vessels will begin on a new scale. Ferrying of American-made planes to British and Russian combat areas will become faster and more efficient.

It portends a new era for U. S. aviation, deep with meaning for post-war international air transport, one with many wartime ramifications.

Plans now formulating in Washington prepare for "emergency measures" by the Military under which the Navy would "adopt" American Export Airlines and its three new long-range Sikorsky flying boats, and the Army would step all the way into Pan American Airways' ferrying and transport operations, should Pan American run into difficulties. Such action would not

(Turn to page 12)

What's Inside

- 900 Lightplanes for Ground Forces .... Page 6
- Air Arm Leads Naval Expansion ... Page 13
- Aircraft May Adopt Wood Industry .... Page 18
- Blind Landing Systems by Spring .. Page 28
- CAB Is Warned of Short Views .... Page 30
- Airports Swing to Ultra High ..... Page 38
- Buying and Selling on Aviation Market ... Page 40
- Airline Equipment Pooling Urged .... Page 45

And Regular Features

Aerial Guardian of the Sea

FORTNIGHTLY REVIEW

Ignoring Facts

While Mr. Carl Vinson is ...ting the stage scenery be... the curtain raising on his ...fit limitation hearings in the ...use of Representatives in ...cember, it might be timely ... point out to the Georgia ...ngressman that his pro...ted series of hearings will ...tribute nothing construc...e to the national welfare at ...s urgent period of war plan...ng.

As chairman of the House ...val Affairs Committee Mr. ...nson should know that his ...eddling and investigations at ...is time can only confuse and ...tard the defense picture, ac...mplishing nothing for the ...enefit of either the industry ... the taxpayers, and take up ...luable time of men vitally ...eeded in the management of ...merican industry.

Just as the gigantic ma...inery of industry is reaching ...ll speed on defense produc...on, Mr. Vinson wants to stop ...e wheels in the apparent be... that it just *can't* be work... smoothly. It's like stop... the runners in a 100-yard ...h at the 75-yard line ...ely to find out if all the ...ners are properly tagged ...d entered in the race. As ... loyal Georgian Mr. Vinson ...ould be the last to want to ... called unpatriotic, but his ...rrent efforts in pushing his ...-conceived bill are just about ...at and nothing else.

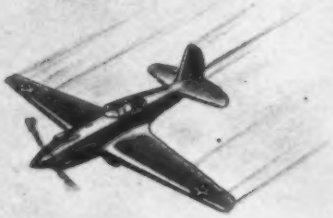
Perhaps the greatest irony of ... in the 7% profit limitation

(Turn to page 14)

U. S. NAVAL LIBRARY NOV 18 1941 BLACKSBURG VA.

3.8 to 5 pounds saved-

1. PESCO Stand-by Fuel Pump—a standard pump with new light-weight motor. Pump has diaphragm type relief valve with pressure regulation balanced to atmospheric conditions.



WITH THESE NEW PESCO *motor driven Fuel Pumps*

• In modern planes requiring as many as 5 auxiliary fuel pumps, a saving of several pounds per unit represents a substantial total. The new PESCO fuel transfer and stand-by pumps feature compact, high-speed motors with gear-reduction drive and actually weigh 3.8 to 5 pounds less than former models. The explosion-proof motors meet latest Air Corps specifications and are available for 12- or 24-volt systems. In addition to the models illustrated, other units can be supplied for special requirements.

SPECIFICATIONS AND PERFORMANCE DATA ON PUMPS ILLUSTRATED

	Capacity G. P. H.	Pressure P. S. I.	Motor Hp.	Amps.	Volts	Weight Lbs.
1. Three Sizes	225	20	1/10	5	24	5.8
	350	20	1/8	8	24	7.0
	350	15	1/8	6.5	24	7.0
	650	8	1/8	7	24	8.5
2. One Size	325	18	1/10	6	24	8.2
3. Three Sizes	280	5	1/10	3.8	24	5.0
	360	15	1/8	7	24	6.6
	650	8	1/8	7.2	24	6.8

Can be supplied with or without motor base. Base weighs 0.2 lbs.

2. PESCO High Altitude Fuel Pump—with variable displacement for pressure regulation, eliminating internal vapor lock encountered at low atmospheric pressures.

3. PESCO Fuel Transfer Pump—a standard positive displacement pump with new motor. Model illustrated shows motor with base.

PUMP ENGINEERING SERVICE CORPORATION

DIVISION BORG WARNER CORPORATION ★ 12910 TAFT AVENUE ★ CLEVELAND, OHIO

The Manta—New Long-Range Fighter Type

West Coast Firm Claims 'Perfect Version' of Davis Wing in Craft Designed to Fill Flying Needs of War

By JAMES L. STRAIGHT
Editor, West Coast Department

MANY A THEORETICAL "dog fight" has been waged in the wind tunnels these many months and there is no mistaking the reason why.

The demand has come for fast, heavily armed, long range fighting planes, fighters with sufficient range to convoy the batches of heavy bombers destined to come off U. S. assembly lines, fighters to successfully intercept an enemy's huge bomb carriers.

But long range fighters are lacking. There isn't a single one on hand to fill the bill.

And so the wind tunnels have been humming. Almost every major combat plane manufacturer, and a few you seldom hear about, has secretly developed a long range fighter to the mock-up stage, perhaps has progressed even further.

Yes, the fighters will come, claim industry spokesmen, and will appear in novel form, for it takes radical design to produce the type desired.

Design interest is focused on the airfoil, long the center of performance advancements, and now considered the major impediment to greater speeds. And one unmistakable trend is toward the radical thickening of the leading edge of high speed airfoils.

The Northrop Flying Wing, shorn of much of its mystery by AMERICAN AVIATION on Nov. 1, was designed for maximum airfoil lifting power. Now the word is being passed along in aviation circles that Curtiss-Wright has developed a flying wing design. Such designs would presumably tend to revolutionize post-war transport flying, but would be of more immediate importance as long range fighters.

One of the most radical airfoil departures of recent years has been the now famous "Davis Wing," perfected by west coast inventor David R. Davis under one of the few mathematical formula patents ever granted in this country.

Much notoriety has been given this "high lift" wing for its use on the popular Consolidated B-24 bomber, and on the Consolidated Model 31 flying boat.

What inventor Davis has been doing behind closed doors this last year and more has up to now been a mystery, but AMERICAN AVIATION now reveals exclusively many of the details behind the adaptation of the Davis wing formula to a *long range fighter design.*

For during the recent publicity splurge given John Northrop's radical tailless plane, the young Manta Aircraft Corp. of Los Angeles sat back with a novel plane design of its own, one it claims as the solution to the long range fighter problem.

The craft—to be known as the Manta—was designed by Davis, who is executive vice president of the Manta company. Manta President John P. Davies describes the design as the "perfect version" of the Davis wing.

In the Manta design the Davis formula is said by the company to produce a contour vastly different in appearance but basically the same as that which reportedly brought about the added lift and stability to the B-24.

The company claims the development of an airfoil meeting the puzzles of that lightning like stretch of speed just under the speed of sound in a long range fighter design coupling extreme speed and maneuverability with good control and flying characteristics at lower cruising and landing speeds.

"The identical formula that produced the long, moderately tapered lift wing of the B-24 has produced the highly tapered Manta wing in the hands of the same engineer with different objectives," comments President Davies.

The peculiar shape of the Manta wing tips is said to eliminate the dangers of wing-tip stall at slow speeds, called a characteristic fault of previous highly tapered wings.

Davies claims that until the Manta wing-tip design was evolved, there was no efficient way to avoid the dangers of tip-stall in a wing so highly tapered.

William Waterhouse acted as co-designer, with inventor Davis, of the Manta. Waterhouse reportedly the designer of Charles Lindbergh's famous "Spirit of St. Louis," assisted in engineering the Lockheed XP-38 interceptor. Wallace H. McLaughlan, formerly with Vega, Kinner and other aircraft engineering departments, assisted in wind tunnel drafting, Dr. Russell M. Otis, as chief research engineer, in stress analysis and patent supervision.

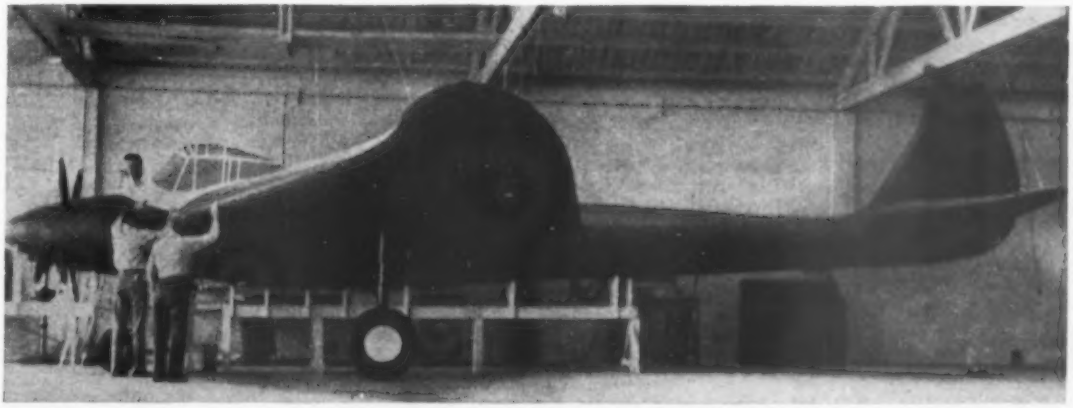
Whether the Manta will bear out the producer's claims has yet to be seen. But designer Davis has just completed two years of wind tunnel work on the design, and a mock-up with 50 foot wing span has been built.

President Davies states that engineering is ready for constructing a prototype—or first production model—as soon as manufacturing facilities are available. Present plans call for a composite steel and plastic-bonded plywood structure, with liquid-cooled in-line engine of at least 1150 hp. (It is elsewhere reported that Timm Aircraft Corp. is prepared to build production models of the Manta design after production of its own new plastic-plywood trainer is stabilized—Ed.)

In the mock-up the leading edge of the wing is 42 inches thick. Aspect ratio of this wing plan is six to one, compared to the 11 to 1 aspect ratio of the Davis wing on the B-24. The mock-up has a retractable landing gear and comparatively small control surface area on the empennage.

Predictions by Manta's president embody the answer to a military aviation expert's prayer, include: a range of 10 hours, or the much sought after 2,500 mile fighter range, and speeds up to 445 mph. in level flight, while carrying four shell-firing cannon and four heavy machine guns with large ammunition loads. Other predictions: climb to 16,000 feet in 4½ minutes with two hours of fuel, and 40,000 feet in 18 minutes; and a landing speed of 50 mph., empty of fuel and ammunition.

Davies bases predictions of outstanding speed and economy of construction on the straight lines on all edges of the wing plan, and favorable location of the center of gravity from a stress viewpoint.



American Aviation Magazine, Vol. 5, No. 12, Nov. 15, 1941. Published on the 1st and 15th of each month by American Aviation Associates, Inc., American Building, Washington, D. C. Printed at The Telegraph Press, Cameron and Kelker Sts., Harrisburg, Pa. Subscription rate, $3 a year; $4 for two years. Entered as second class matter at Washington, D. C. with additional entry at Harrisburg, Pa.

Air Scoops

October Production . . . Glider Training Plans . . . Ferrying Tragedy
Planes and Subs . . . Pan Am's Partners . . . Stout Skycar

Shhh! Secrets

Note from our "military secret" file: "October plane deliveries gained 360 over September." That adds up to a round number total of 2,270 for October. Take it for what it's worth. We're inclined to think it's correct . . . Indicative of first *quota-raising* under the Administration's new "Victory Campaign": the Omaha (Martin) and Kansas City (North American) medium bomber plants were originally set to turn out 100 bombers each a month. Now it's 115 each. The Fort Worth (Consolidated) and Tulsa (Douglas) heavy bomber plants were each scheduled for 50 monthly. Now it's 65. All four plants should be operating by early spring.

Wild Geese

A wild goose chase of two weeks running leaves us out of breath, barely able to report that at this writing the Civil Air Defense plan rests gently on Gen. Arnold's desk in the Air Corps, awaiting his approval before release. The delay has all the earmarks of a publicity stunt, but if the program isn't officially announced during Civilian Defense Week (Nov. 11-16) we are willing to count that explanation out. Actually, the War Dept. admits holding up the announcement, but insists no major objection to the plan is involved, merely the *usual red tape* surrounding Army procedures.

Soaring Boom

Glider plans are gaining altitude in the War Dept. and on Capitol Hill. Official adoption of an Army Glider Corps is pending the smoothing out of details, and inside Army talk tells of an expanded glider training program coming up, possibly with contracts to civilian schools providing instruction along lines similar to those for power plane cadets. One hundred additional officers are soon to be detailed to glider training and will augment the school instruction.

No less than five bills are up in the House for civilian glider training programs. Senate action has crystallized around Sen. McCarran's National Youth Glider Pilot Training Bill. The *one-man-show* behind all action on the McCarran measure is Charles T. Malone of Washington, an examiner for the Federal Reserve System. Malone also organized and is president of the newly formed American Glider Association.

Deep Sea Fishing

The newspapers hopped on the story of a Lockheed Hudson bomber under British command bringing the crew of a German submarine to the surface and hovering over the spot until the sub was captured. Completely missed was the spicier little tale about the Northrop N-3 seaplane which actually *captured* a German U-boat, lock, stock and barrel. The plane dropped bombs, then landed beside the sub, disarmed the crew and forced the boat to port, according to observers back from England.

'Errors of Judgment'

One "defense strike" never publicised occurred in Canada with American pilots on North Atlantic ferrying duty as the strikers. Brief, but to the point, the strike followed the second of two quick succession ferry plane crashes in England which together took 44 lives. As a result of the verbal picketing, Britishers no longer take the controls on flights to England, *or return.* About that second crash . . .

From the House of Commons Official Report, Oct. 9, 1941: "The finding of the Chief Inspector of Accidents on the second accident is that it was due to errors of judgment of the captain, first in taking off along the wrong runway, presumably through an oversight as it was not the one which he had declared his intention of using; secondly, in allowing the aircraft to swing to port, with the result that it left the runway and took to the grass; and, thirdly, in not shutting off his engines immediately this occurred."

From a confidential letter being circulated among airline pilots in this country, written by a former ALPA member now with the North Atlantic ferrying unit: "The second accident was also by a pilot of the B.O.A.C. In this case he selected a runway with trans-Atlantic load of 900 feet in length, up grade, cross wind. When the pilot gave the throttle, a mechanic ran forward and tried to stop him. He proceeded nearly 200 yards when he left the runway to the left and continued on the sod portion of the field, leaving three deep ruts as his wheels cut in. In this manner, he continued for 1,200 yards with throttle wide open, crossed a small hedge fence, carried away a guard house, tore through a wire fence, crossed a railroad track, and bounced off, splitting open the tanks at which place the aircraft and all on board burned. In a summation, he definitely could not have gotten off the run way with no load; second, he never attempted to cut his throttle in the entire run."

Mutiny on the Bounty

There is a widening rift between Pan American Airways' 50-50 partner Panagra, W. R. Grace & Co., and potential mate on the California-Hawaii shuttle, Matson Steamship Lines. These two ship owners, fretting over the eventual loss of luxury travel to air transport, have their own ambitions about operating sky fleets . . . On the South American west coast, long their land and sea domain, the powerful Grace interests pull *farther and farther* away from Trippe domination . . . In the Hawaiian sector, however, the steamship crowd faces the same snag Export Airlines ran up against: Congressional disapproval of *air mail* subsidies to *steamship* firms. Pan American, realizing this, is now content to appear before CAB outwardly accepting Matson's extended hand.

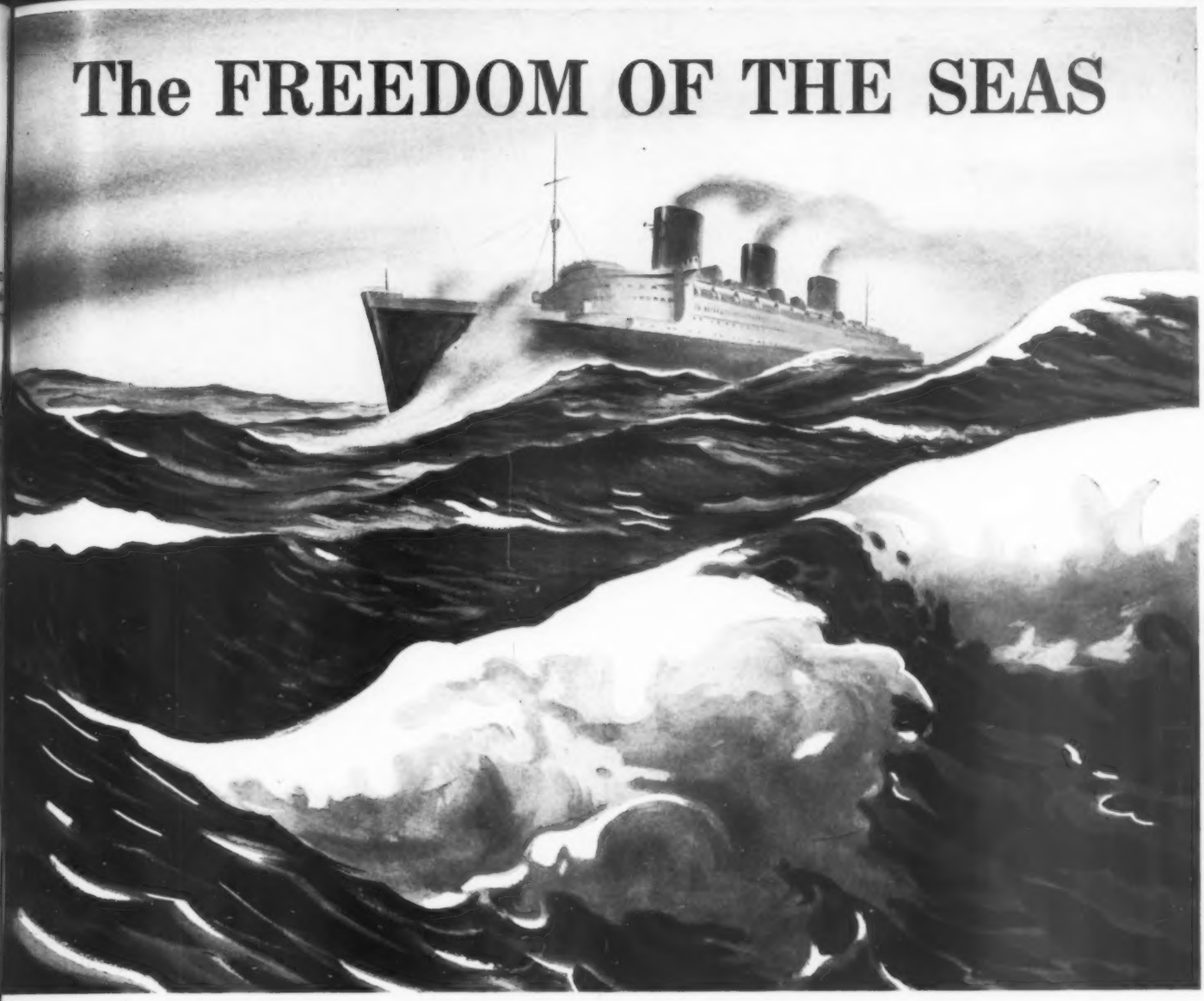
Assembly Line Tales

Stout Aircraft's radically-new Skycar should make its debut shortly, with the first of this lightplane type to be offered to the Air Corps, more than a little interested in the plane's four-wheel landing gear and the possibilities of two *machine guns* up front . . . Friends of inventor David R. Davis claim the new version of the Flying Fortress appears to incorporate features of the famous Davis "high lift" wing . . . Aircooled Motors is developing new engines designed for robot target planes . . . Low-priced, adjustable-pitch propellers for lightplanes are soon to reach the market through collaboration of two midwest firms, one an engine maker, the other a parts manufacturer.

Flapping Wings

Sen. Bennett Clark, busy "isolationing," leaves the air safety work with which his sub-committee is charged to his chief investigator, Lieut. Harper, who usually bobs up at major crashes, as he has recently. Lieut. Harper centers his interest in what he calls "the spin and stall characteristics of the DC-3." He is understood to think some sort of wing flap or wing slot would come in handy on this ship. In fact, this retired Naval officer has been personally interested in such gadgets for years.

The FREEDOM OF THE SEAS



Seventy per cent of the earth's surface is covered by water—about 140,000,000 square miles.

But infinitely more vast than the waters of the earth is the universal air. The Atlantic Ocean is a mere puddle when compared with the immensity of Space.

The air is not divided into individual oceans because it covers the earth's surface, not seventy per cent but one hundred per cent. Air is the common denominator of all peoples, everywhere. It is the only "uninterrupted navigable ocean which comes to the threshold of every man's door."

* * *

Your home may be hundreds of miles from the sea. The *Queen Mary* cannot dock at Phoenix and the *North Carolina* cannot drop anchor at Indianapolis. But every community on earth is a potential world port for the ships of the air.

For centuries, travelers have had to change vehicles where land ends and ocean begins. But it matters little what is beneath the airplane—mountain or valley, water or desert. Now, a single vehicle, the airplane, can transport you over any and all of the surface of the earth.

* * *

"Freedom of the Seas" has been re-affirmed by the President of the United States as a requisite for universal peace. And why? Because it is the basic requirement for peaceful international transportation.

The oceans of water are today being crossed in a few hours by the airplane, operating in the ocean of the air. When you think of the future of the United States in this rapidly changing world, include in your thinking the ocean of the air. As the airlines of the United States already have made twin cities of New York and Los Angeles, airliners flying the Stars and Stripes inevitably must link together all the capitals and markets of the world.

* * *

"Freedom of the Seas" means freedom to use, in peaceful commerce, the oceans of the world—the oceans of water *and* the universal ocean of the air.

In exact ratio as we think in terms of air transportation *within* the United States, and utilize it, will we be prepared to participate in international air commerce. Without that participation, America cannot be adequately represented, either in commerce or defense.

C. R. Smith
PRESIDENT

AMERICAN AIRLINES *Inc.*

ROUTE OF THE FLAGSHIPS

Army Ground Units Promised Light Plane

Non-Flying Branches Allotted About 900 Military Liaison Ships

THE nation's ground forces have been promised "about 900" lightplanes for observation and courier work behind the lines, with the stipulation that only Air Corps pilots fly them, high military sources have revealed to AMERICAN AVIATION.

Initial order for the Army's new "grasshopper squadron" comprises 80 planes, on which first deliveries were being made for service in current maneuvers as this issue went to press.

First deliveries were made to Patterson Field by Piper Aircraft Corp. before the initial order had passed from Wright Field, where it was negotiated, to the Under Secretary of War's office in Washington.

Piper to Deliver 40

Piper is to deliver 40 of its O-59s, Aeronca 20 of its O-58s and Taylorcraft 20 O-57s under terms of the order, it was learned. These three military lightplane types have been tested at Wright Field after four of each type were delivered within the last two months to the Air Corps under service test contracts.

Additional orders are expected to follow until about 900 light ships are obtained for courier work by the Field Artillery, Cavalry and Infantry.

Whether more than that number of the little planes will be bought for the Army, or whether other lightplane manufacturers will reap benefits from the Air Corps' new but reluctant stand, is extremely speculative at this time. Meanwhile, Stinson O-49s, the Air Corps' favorite light ship, continue to be delivered, mainly for duty with Air Forces units.

Promises for the 900 ships came from Maj. Gen. H. H. Arnold, chief of the Army Air Forces, to heads of the three ground units of the Army.

Prediction Borne Out

This development bears out the prediction made exclusively to AMERICAN AVIATION by a high ranking Air Forces officer (reported in the Oct. 1 issue) that the Army would buy "hundreds" of lightplanes.

No specific mention was made of 900 as the figure allotted, but the Field Artillery is known to have been granted its request for about 300 courier planes, and the Cavalry and Infantry their requests for similar numbers. Final deliveries on these planes were not expected to be made for several months.

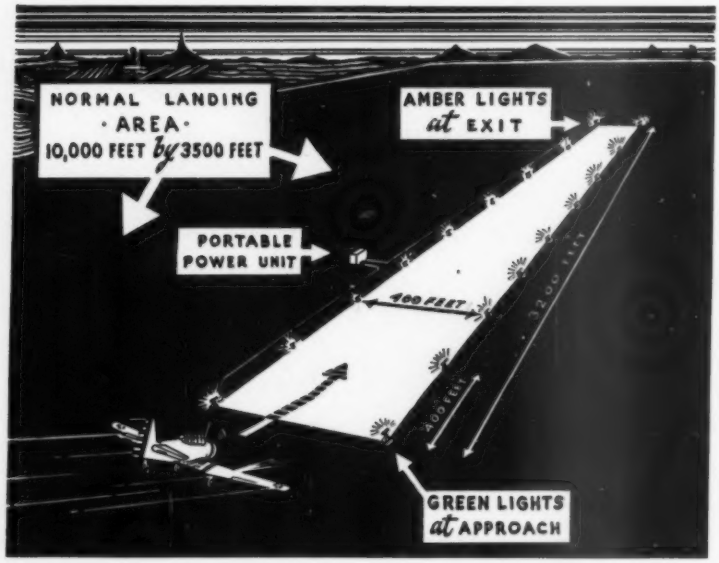
There is no secret about the fact that the Air Corps was reluctant to order the light military planes, and the first order came only after substantial "campaigning" had been made within the War Dept. by high ground force officers.

These officers had also sought to pave the way for piloting by members of their own units, but the Air Corps held out against this development winning temporarily in its demand that Air Corps pilots man the ships, with ground unit officers acting only as observers.

Pay Problem Arises

Just how the Air Corps has solved the problem of paying military lightplane pilots, one of the factors which has "snagged" acceptance of the request for courier planes, has not yet been revealed. (Combat pilots, like paratroopers, receive pay and a half. Similar rates for pilots of light military ships would naturally meet with objections, making a pay adjustment of some nature almost mandatory.)

Refusal of the request for ground force pilots is interpreted to mean that the proposal of General Aircraft Corp. to teach ground officers to fly its "spin-proof" Skyfarer with only four or five hours of instruction has been turned down by the Air Corps. It can be expected, however, that more and more ground officers will be encouraged to learn to fly "on their own time" at the Army posts throughout the country, looking forward to the day when the restrictions will be relaxed.



'Cramped Field Suddenly Unfolds'—

AVIATION CADETS at Randolph Field, Tex., are finding their night landings short but sweet these days as the Air Corps' latest innovation, a tiny portable landing field, prepares student pilots for cramped setdowns. Operated by a small portable gasoline power plant, the miniature lighting system outlines a runway, 3,200 by 400 ft. Pilots, aided by green signal lights, must make a perfect approach since the squatty, hooded landing lights are visible only from a point opposite the runway approach. Tiny apertures in each hood thrust out parallel beams, cause field to unfold suddenly as the pilot comes into line with the 16 light standards.

'Plugger' for Lightplanes

Gen. Danford Sees British 'Flying Artillerymen'

One of the greatest exponents of lightplanes for courier and observation service with ground units of the Army is Maj. Gen. Robert M. Danford, Chief of Field Artillery, who had the opportunity to see the use made of light military ships during a recent trip to England. Gen. Danford has been a leader in the inner War Dept. struggle to secure light military planes for the ground branches.

Basing its comments on the observations made by Gen. Danford on the British Artillery's newly acquired "flying OP" (understood to be made by Piper), the magazine *Army & Navy Register* states in a recent issue:

"The flying 'gunner' was a young artillery officer who previously had been given a short course of instruction in piloting the plane. The British appear to be well satisfied with this new method of obtaining that much-sought-after aid, aerial adjustment of artillery fire. The artillery of the British Army now has its own light observation planes flown by artillerymen."

If You're Seven Degrees Off

You Miss the British Isles Entirely

TRANS-Atlantic ferrying—how it looks to the man at the controls after his first trip across—is told in the letter that follows, a letter just received by a member of AMERICAN AVIATION'S staff, from Capt. Lloyd L. Juelson, veteran U. S. airline pilot now on duty with the RAF Ferry Command. In his middle thirties, Captain Juelson has been a pilot with the old Ludington airline, Eastern and PCA, among others. His letter has not been cut by the editors of any reference to the ferrying activity, although sections of a more personal nature have been deleted.

"Dear————

"I have so much to tell you that it would require several hours to tell you all, even if I were talking to you . . . In the first place, I suppose you would like to know what I think of the Atlantic. Well, there's an awful lot of water out there and to tell the truth I never saw the ocean once in either crossing. I was on instruments for over 10 hours. I made a landfall over the north coast of Ireland, and it was a wonderful sight to me . . .

"I am sorry I cannot tell you all the details of both crossings. We are censored, but I can tell you a few things. The first is that as long as everything works all right with the engines and instruments it is no worse than flying over the Alleghenies from New York to Chicago. If things don't work at any time on the trip, it can be just one of those things. All the precautions for your safety are taken and all the things that are humanly possible to do are being done.

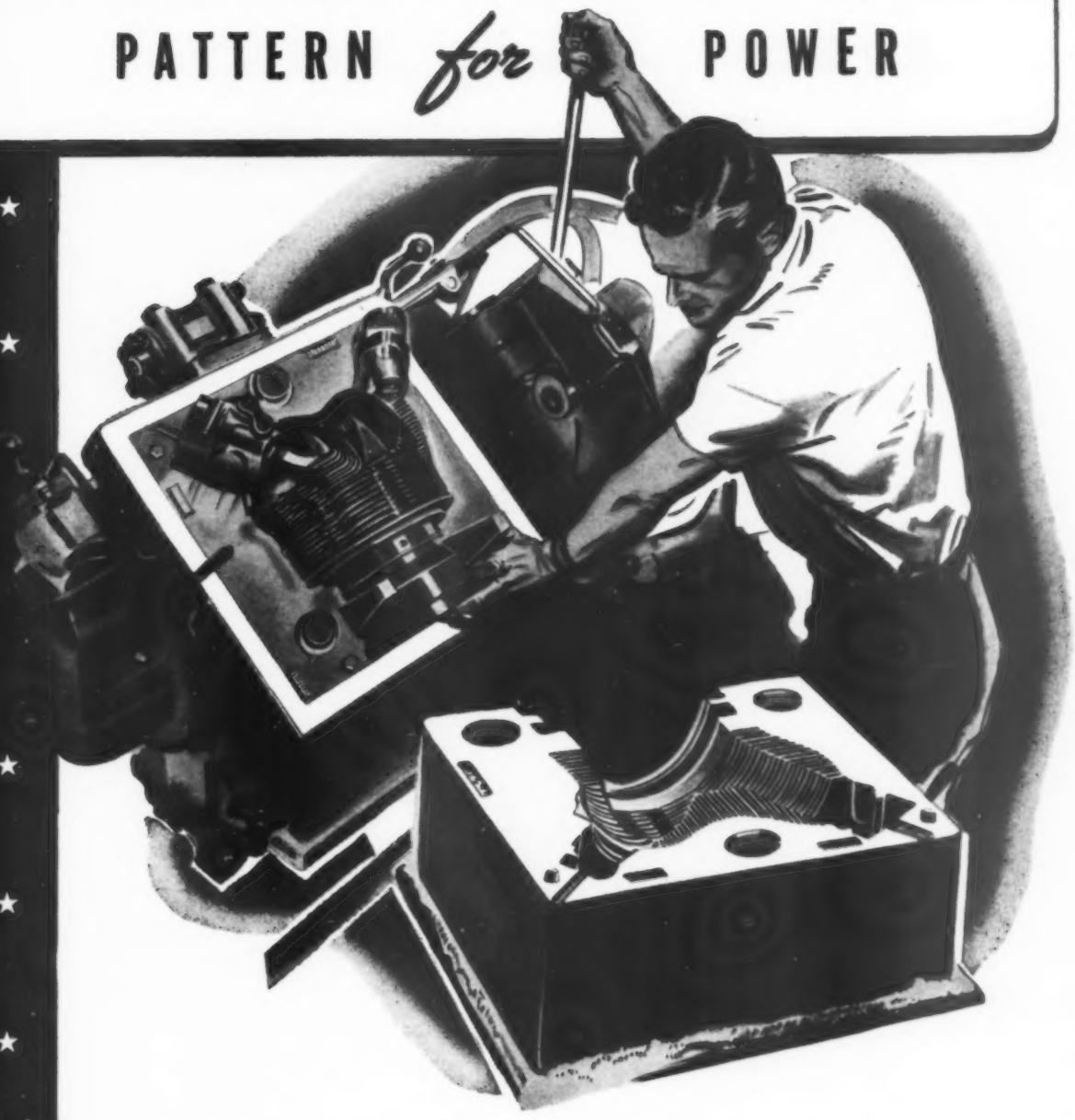
"You only have to be seven degrees wrong in your compass heading to miss the British Isles entirely. If your celestial navigation is not good—if the Atlantic doesn't get you the Jerrys will and you most likely will be interned for the duration.

"I went over as captain, with a crew of three, and came back in a B-24 bomber made by Consolidated, 4-engine type, designed for bombing but not for carrying 18 pilots west bound across the Atlantic.

"The trip from England was non-stop to Montreal, taking 15 hours. We flew at 22,500 to get out of the and with no heat in the ship, and no oxygen it was bitterly cold, even with heavy flying suits, and six boys passed out due to lack of oxygen and were out for three hours. It leaves you with a devil of a headache for a couple of days. It has rather a peculiar feeling to pass out due to lack of oxygen, your mind still functions but your muscles are unable to obey commands. . ."

Yours,
(Captain) Lloyd L. Juelson

PATTERN *for* POWER



BEHIND the casting of a cylinder head for a Cyclone 9 lies a quarter of a century of painstaking foundry experience. Patient experiment with metals and sands has produced a technique for dissipating the roaring heat of explosions which create 1250 fifteen-ton power impulses a minute and make possible the 133 horsepower produced by each cylinder.

From the deft hands of master craftsmen have come moulding processes so expert that fins of metal as high as 2¼" and as thin as .064" can be formed by pouring molten aluminum into ordinary sand. These fins constitute the more than 15 square feet of surface that regulates the temperature of each cylinder when Cyclones power the ships of commerce and defense.

WRIGHT
Aircraft GINES

WRIGHT AERONAUTICAL CORPORATION • PATERSON, NEW JERSEY

Division of Curtiss-Wright Corporation

Air Ministry Reveals . . .

Why British Howl for Bigger Bombers

By Robert B. Hotz

THE British howl for bombers—more bombers, bigger bombers. American plane production schedules are again being boosted to make them. *Bomber Command*, the Air Ministry's amazingly frank account of this RAF stepchild in action, tells the story behind the story of the "bomber demand."

The French had only 40 day bombers to meet the German invasion . . . The English had only 135 more in France to support them . . . The Allies lost 40% of their day bombing force in the first few days of the German attack . . . Day bombing of the German armies virtually ceased during the first week of the battle . . . Not until a year and a half after the war began did a British four motored bomber fly over Germany . . . Only the north and western fringes of the Reich have been heavily bombed by the British . . . At the end of last summer—and perhaps not yet—not a single Lockheed Hudson, Martin Maryland, Consolidated Liberator or Douglas Boston had been assigned to the bomber command.

These are a few of the reasons for the heavy British bomber demand as revealed in *Bomber Command*.

The RAF bomber command went to war in September 1939 with the 1923 Hague convention rules of aerial warfare as its guide and the speedy destruction of the German fleet as its task, reports the Air Ministry. The Command has learned a lot since then, due principally to the gallant airmen who manned its ships.

Low Flying Blenheim Attacks Cologne

British air strategy admittedly subordinated bombers to fighters in a pre-war production program too slow and too small to adequately provide for both. As a result, the men of the bomber command fought the first two years of the war in light and medium bombers that were still "new and comparatively untried aircraft" when the war broke out.. According to the air ministry, the slow, two and three man Hinds, Wellesleys, and Harrows were discarded only during the spring and summer of 1939, and the bomber command was trained only a few months in the four to six man crew Hampdens, Wellingtons, Whitleys and Blenheims before they flew them through North sea storms to raid the German fleet. Small wonder *Bomber Command* notes that on these sorties weather took as heavy a toll of British bombers as did German flak and fighters.

Lack of sufficient range and bomb load in the Fairey Battles, Blenheims, Whitleys, Hampdens and Wellingtons also cut efficiency of bomber command operations. From their pre-war base in France, for instance, Battles had been able to penetrate only 20 miles behind the German lines on day reconnaissance.

In attacking the German fleet in its northern bases and later in sorties against the Norwegian coast, bomber command ships were operating close to their maximum range and consequently carried heavy fuel and light bomb loads. Land based fighters harried them from 70 to 200 miles out to sea on their return trips. The bomber command target map of Germany indicates that only the North sea ports and Rhur and Rhineland industrial towns have been heavily hit. These are the targets closest to British bomber bases, and even though four motored Flying Fortresses, Halifaxes, Stirlings and Manchesters have now joined the bomber command, they are apparently not yet available in sufficient numbers for significant excursions over Germany's inland industrial vitals.

The early emphasis on blasting the German fleet and continued hammering of the Atlantic, North sea and invasion coasts reveal that the threat of German seapower has apparently diverted the bulk of the bomber commands' already insufficient numbers from its main industrial objectives.

Blenheims Downed

The targets changed often during the next two years but the saga of the bomber command is studded with accounts of low altitude attacks, incredibly brave, usually successful, but generally fatal. Eleven out of 12 Blenheims went down in the low altitude blasting of a German panzer division in northern France. Six Fairey Battles broke the Albert Canal bridges in a dive bombing attack. Only one returned. An attack that wrecked German pontoon bridges across the Meuse at Sedan cost 35 out of 67 Battles.

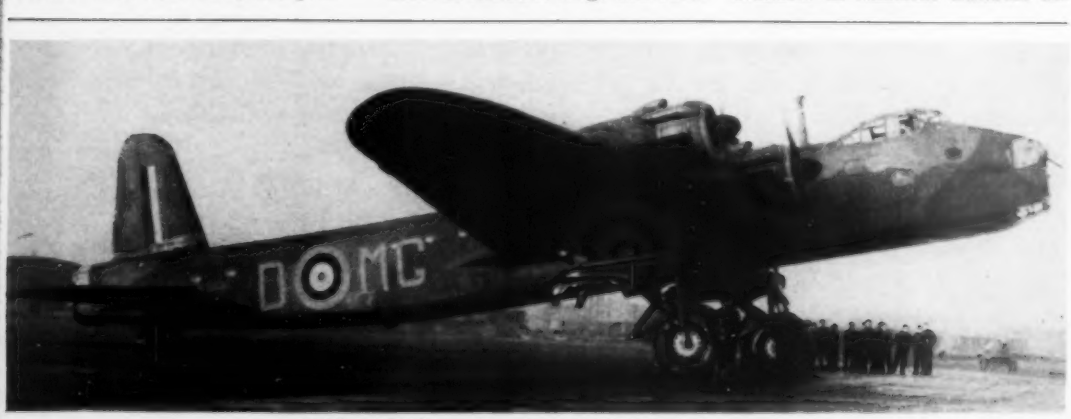
In the battle of France, lack of information, wrangling with the French, swarms of German fighters and heavy flak made the bomber command's job hopeless. Once the bomber command blasted a Dutch airport just after Dutch troops, unknown to the British, had recaptured the field from German parachutists. Before the invasion began the French told the British they couldn't do any day bombing because they had only 40 day bombers in service. The British warned the French not to expect much British bombing support. During the first few days of the attack the Allies lost 40% of their day bombers and daylight bombing of the German armies virtually ceased before the end of the battle's first week.

Major Triumph

Then after the battle of Britain came the bomber command's major triumph—the battering of the invasion ports and smashing the fleet of barges and boats gathered for the final assault on England. The bomber command proudly notes "no invasion took place."

To Americans who watched our heavy bomber program increase to a 500-a-month schedule and now hear authoritative talk of doubling it, the experence of the RAF bomber command in its two year trial by fire is doubly significant. It seems apparent that as long as the RAF bomber command is limited either by numbers, range or loads of its equipment to hammering the fringe of its foe's industrial web, it can neither support a full scale invasion of the continent nor land the knockout punch on German war production.

That is why the British howl for bombers—more bombers and bigger bombers—and a chief reason why Roosevelt administration strategists are howling for the American aircraft industry to step up bomber production.



A Short Stirling—Popular British Heavy Bomber

'Farming Out' Threatened

Profit Limit May Block 'V' Campaign

By CELESTE W. PAGE

THE Administration's almost frantic efforts to speed up aircraft production—ultimately to be doubled under the "Victory Campaign"—by increasing the farming out of orders to small companies may be seriously jeopardized if Congress passes a profit limitation measure, according to the anxious observations of certain officials charged with the responsibility of contract distribution.

Where critical materials are not involved, commercial companies tend to shy away from government business because of the unfamiliar complications of government procedure, inspections and bookkeeping.

There is mounting concern that even those manufacturers whose production is injured by material shortages may prefer to convert their facilities to other types of commercial work, or shut down altogether rather than run the risk of severe losses should the Vinson proposal be adopted.

December Hearings

The Vinson bill, which would impose a 7% ceiling on all profits from defense orders, is scheduled for hearings to begin on December first.

It is feared that a 7% profit limit, with no guarantee against losses, would act as a potent factor in discouraging small companies from participating in the air defense program.

This development occurred simultaneously with the opening of negotiations by Floyd Odlum, chief of the OPM Division of Contract Distribution, with several large aircraft manufacturers on a project to absorb into the aircraft industry a block of aluminum pots-and-pans makers. Odlum is seeking to arrange for the "adoption" of a group of aluminum utensil producers for training as subcontractors in the airframe industry.

Particular emphasis is placed on the possible dragging effects of the Vinson bill in light of a new controversy over the question of whether the Congressman seeks a 7% profit limit *before or after taxes.*

Excludes Taxes

Although the bill as it is now written clearly prohibits inclusion of taxes as an item of cost, reports have circulated in Washington that an amendment may be offered changing the provision to make it after taxes, as a compromise designed to improve the chances of enactment of the measure.

Industry experts contend that a 7% limit before taxes would allow only a 1 to 2% profit, if the full 7% is realized on all contracts. They point out that experience under the defense program indicates, however, that a loss on a single contract might be severe enough to wipe out all profits and even impair capital investment permanently, since application of the law in subsequent years would not present the opportunity to recover. A change to after taxes would relieve the situation somewhat, but would not be sufficient to keep private industry on a sound basis."

Consequently, there is considerable anxiety that the opportunity for heavy losses would be so much greater under a profit limitation law that it would impair the current contract distribution programs.

The extent to which aviation may be able to absorb small commercial companies as subcontractors, from the production standpoint, is expected to be explored shortly on Capitol Hill when the Murray Committee of the Senate, created to investigate the problems of small business, opens hearings in the near future.

Committee spokesmen indicate that executives of the larger aircraft companies may be called to testify on their subcontracting policies and answer any charges against them by small companies, some of whom have complained that their offers to engage on aviation subcontracts have been arbitrarily refused by the big prime contractors.

CAUGHT IN THE ACT by the photographer while pouring over "military secrets" submitted by aircraft manufacturers and other defense producers in response to committee questionnaires, these members of Rep. Vinson's staff are compiling data to support the Vinson profit limitation argument. The staff (about 100) is perhaps the largest on Capitol Hill, so big that members are forced to work in the corridors of the Old House Office Building, as evidenced in this exclusive picture.

Army-Navy Briefs

NEW AIR CORPS Replacement Center for the Gulf Coast Air Corps Training Center was opened Nov. 12, receiving 1,972 cadets who reported as the first class to go through the new 10-week preliminary training course preparatory to beginning flight instruction. The center will have an ultimate capacity of 4,700 cadets when completed next Feb. 15.

●

WAR DEPT. has authorized reopening of the Lordsburg, N. M., airport for use by Army aircraft. The field will be utilized as an auxiliary airport primarily for trainees from Luke Field, Ariz., on cross-country flights. Lordsburg formerly was an emergency landing field and fuel station, but as planes developed greater range less frequent refueling was required and the airport was abandoned.

●

TRANSFER of bombardier training facilities from Barksdale Field, La., to Army Air Corps schools on the Gulf Coast and far west where weather conditions are generally more favorable for such instruction is reported by the War Dept. Barksdale will be designated as an Air Forces base to replace Albuquerque, N. M., which is to become one of the new stations for training bombardiers.

●

PILOT production in the Southeast Air Corps Training Center reached a new high Oct. 31, when 447 aviation cadets—representing the eighth class turned out in this area—were graduated and commissioned as second lieutenants. The number of officers receiving their "Wings" at four advanced flying schools more than quadrupled that of the first SEACTC class graduated less than a year ago.

The record output was partially the result of recent activation of the new two-engine and navigation school at Albany, Ga., which yielded 152 new officers in its first class. Eighty-six of the graduates were commissioned at the Maxwell Field, Ala., advanced flying school, 110 at Craig Field, single-engine pursuit school at Selma, Ala., and 99 at the Barksdale, La., two-engine school for bombardiers.

XUM

Mobilized...

Giant hydraulic presses, equipped with Goodyear rubber press head, speed metal forming operations.

MEETING the need for more airplanes *now*, Goodyear Aircraft Corporation is fully mobilized and in action — turning out airplane subassemblies to supply production schedules of many leading manufacturers.

When the call came we were ready with veteran engineers of lifelong experience in aeronautical design . . . with master workmen highly skilled in the difficult art of light metal-alloy aircraft construction . . . and with facilities for fast production.

Today in our great aeronautical works, sheet metal parts are flowing in endless stream from giant presses to long lines of jigs — there to be assembled swiftly into wings, ailerons, nacelles, floats, tails and other surfaces for fighting aircraft.

Fully mobilized, too, is our production of tires, tubes, brakes and magnesium-alloy wheels, in greater volume than ever before. And of scores of rubber accessories.

Today Goodyear stands to aviation as it has long stood to the motorcar and truck industries — as the largest supplier of parts and accessories within its specialized field.

LET'S GO! U.S.A. · KEEP 'EM FLYING!

GOODYEAR

SPECIFY GOODYEAR AIRPLANE TIRES, TUBES, WHEELS AND BRAKES

Speaking Off the Record

High Army and Navy Officials Are Anxious For Separate Air Force Showdown Soon

THE separate air force issue is by no means dead on Capitol Hill but will be exploited in public hearings as soon as Senator "Bob" Reynolds, chairman of the Senate Military Affairs Committee, returns from his honeymoon.

Far from fearing these hearings, War and Navy officials are anxious that they be held soon. Until the controversy is settled, the Army and Navy air services are in the uncomfortable position of having to defend their programs from frequent criticism and consequently welcome the opportunity to fight the issue to a finish.

When the hearings open, they will not be unprepared. Great emphasis is expected to be placed on their two major arguments—that the Nazi air force is, contrary to general understanding, not a separate air force at all but highly coordinated with the ground troops operating sometimes under an air commander, sometimes under a ground officer; and that British experience proves that the independent RAF would increase its efficiency by a closer tie-in with other branches of the army.

A number of Army air officers down the line still seek independence from the War Dept. But several high ranking aviation observers have returned from combat zones concerned over the "threat" to Britain's chances of winning the war unless she adopts the U. S. pattern of air organization. A number of high British officials are said to be themselves leaning toward this view.

Certainly, it appears significant that a group of six of Britain's "foremost aerial aces" have arrived in this country to study our military aviation set-up and "new aerial developments" here.

• • •

Airlines to Get Planes On Basis of Defense Use

NEW transport planes for the domestic airlines—228 of them released by SPAB last month—are now being allocated to the individual airlines on the basis of defense utility.

Under an informal and rather flexible system worked out by a special allocations subcommittee of the Civil Aircraft Committee, the planes are being divided among the airlines according to the percentage of traffic which is identifiable as defense travel, frequency of certain schedules to accommodate defense interests and potential future defense requirements. For instance, the return passage of ferry pilots is expected to become an increasingly heavy traffic burden and this, consequently, was borne in mind when the first draft of the allocations was passed out early this month.

Probably a few adjustments will have to be made as a result of last week's meeting when airline executives were granted the opportunity to appear before the committee and kick about the deal they got. But there will be plenty of time for minor changes as deliveries of the equipment are not scheduled to begin until next June, running up to July of 1943.

• • •

Rep. Bulwinkle Heads New Civil Aviation Unit

ON Capitol Hill the new civil aviation subcommittee of the House Interstate and Foreign Commerce Committee, shortly to be appointed, will be headed by Rep. Alfred L. Bulwinkle, North Carolina Democrat and one of the most highly respected men in the House.

"The Major"—he served in the first World War—is a warm-hearted six footer described by intimates as "the soundest liberal among Congressional conservatives." Under his direction, civil aviation legislation is expected to receive intelligent, attentive and sympathetic consideration. But any attempts at fancy lobbying will quickly freeze his natural friendliness. For the Major is "not susceptible to influence" but bases his decisions on solid fact.

The subcommittee will be made up of six other members not yet selected. They will immediately begin hearings on pending civil air bills and attempt to keep the docket clear and up to date . . . Incidentally, appointment of this group is apt to kill off plans of other Congressmen for a separate aviation committee in the House.

C. W. P.

Like First Incandescent Lamp

Douglas B-19 is Experimental Model

To clear up some popular misconceptions about the big Douglas B-19 bomber, the Army & Navy Journal, authorative military publication, points out that the giant plane "is not a combatant type aircraft and never was intended as such, so far as the Army Air Force is concerned. The B-19 was and is to the Air Corps what the first incandescent lamp was to Edison—an experimental model.

"The B-19 was conceived more than five years ago, so it is no secret to expert flyers that it is far obsolete. It was started with the thought of determining whether or not craft of such immense size are practicable. There were a lot of lessons learned in its construction, lessons that will be very valuable should the Air Corps wish to turn to this size craft for combatant work . . .

"Other than minor adjustments the craft has stood up remarkably well under the many tests to which it has been subjected. Of late there have been reports it will be used for good-will flights to Latin America, indicating that the Air Corps has recorded the experiments and is through with the plane so far as further experiments are concerned."

Gen. Brereton Heads Philippine Air Force

Gen. Brereton

MAJ. GEN. Lewis H. Brereton, former head of the Third Air Force with headquarters at Tampa, Fla., has been assigned to command the Philippine Air Force, replacing Brig. Gen. Henry B. Clagett, whose period of foreign service has expired. Appointment of a major general to direct the Philippine air units is in line with the growing strength of the Philippine Air Force.

At present the U. S. territorial air forces are organized to support any action that might be initiated by ground troops. The Philippine, Panama and Hawaiian Air Forces are composed of mixed aviation elements, including transports, bombers, fighters, observation, reconnaissance and similar components. Like the Air Support Commands in continental U. S., they are designed for independent action.

RAF Cadets on Parade

JAUNTILY a company of Royal Air Force cadets parade before their planes at Falcon Field located near Mesa, Ariz., and operated by Southwest Airways Inc. exclusively for English pilots. Leading the column is Flight Lieutenant E. C. Metcalf, who before joining the British armed services last December was a national banker in London and one of England's better known tennis players.

Dive Record Smashed

Glenn L. Martin Test Pilot Ellis D. Shannon last month dived a "Baltimore" medium bomber at a speed of 560 mph., conceded to be a world's record for bombing planes, according to Joseph T. Hartson, Martin executive vice president.

It was not a vertical terminal velocity dive, Hartson pointed out, but a steep one of 65 degrees at close to full throttle. Shannon climbed the bomber to an altitude of 23,000 ft. above the Middle River area before starting the dive. At 17,000 ft. he reached his maximum speed, the airspeed indicator showing 400 mph.

This means an actual speed at that altitude of 560 mph. because the thin air at that height does not build up the pressure to show true speed, Hartson explained, adding that the difference between the indicated air speed and the real rate is easily computed.

Reason for the test dive was to prove the ability of the bomber to dive away from pursuit craft attacking it.

RCAF Extends Pilot Training to 28 Weeks

EXTENSION of the training period for pilots under the British Commonwealth Air Training Plan from 24 to 28 weeks is reported by the Royal Canadian Air Force Headquarters.

The additional four weeks are spread over the three types of schools through which prospective pilots pass before receiving their wings.

Initial training school instruction and elementary flight training are increased from seven to eight weeks each, with the service flying training period extended from 10 to 12 weeks.

XUM

Safety Takes Second Place

Silent on Recent Air Crashes, War Dept. Reports Stable Accident Rate in Past Year

WHILE the latest string of military air crashes in recent months has been the subject of much public concern, whether or not the rise in number of accidents is much out of line with the increase in combat training is still a question mark.

In a general statement issued last week, the War Dept. gave assurance that the *accident rate* in military flying during the past fiscal year has remained "substantially unchanged," but remained mute regarding the succession of fatal crashes recorded in the past few months.

Thus, with definite figures lacking, the question of whether safety has been sacrificed too much for speed in training must remain unsettled until a report showing the relation of accidents to the amount of flying is made available. Such a study is now being prepared by Army officials presumably for release in the near future.

Meanwhile, figures reported by Rep. Harold Knutson (R., Minn.) to the House of Representatives, Nov. 4, indicate that fatalities resulting from military air accidents have averaged about 10 a week for the past two months.

Cites 112 Deaths

Since Sept. 9, there have been 112 deaths in 23 military and commercial air crashes, Knutson told the House in demanding a Congressional investigation of the military mishaps. Two airline accidents involving 34 fatalities are included in these figures, leaving 78 deaths from 21 military crashes during the eight-week period, or only 10 less than the total Air Corps fatalities in the entire year ended June 30, 1940.

Reasons offered by Knutson to support his demand for investigation were to find out if the armed services have the proper types of planes, if pilots are being sent out without adequate training, and if pilots are forced to fly under conditions which make a crash landing "almost certain". Routine investigations, he suggested, will merely hush up the accidents and whitewash their causes. At this time there seems little chance that Knutson's request will be heeded.

The carefully-worded War Dept. statement released last week admitted that the emphasis in pilot training has shifted from safety to the need for "carrying out of missions," but denied any significant change in accident rate during the past fiscal year.

With reference to that fiscal period, the report declared that "although the number of miles flown by Army pilots and students has increased in almost astronomical proportions, the number of fatal accidents per mile flown continued practically unchanged in virtually every phase of military aviation activity.

Accident Rate Lower

"The overall training accident rate is lower than the three-year pre-emergency average established during 1937, 1938 and 1939. All three phases of Army flight training showed decreased accident rates—in other words, an increase in safety.

While primary, basic and advanced flight training recorded a decrease accident rate per mile flown, "there has been a slight increase in the accident rate for pilots who have gone into combat squadrons fresh from the flying schools," the War Dept. said. "This increased rate actually has been lower than the rate which was expected in view of the fact that pilots with aproximately 200 hours of flying experience are going into the cockpits of fast, high-performance warplanes.

"This slightly increased accident rate is expected to continue above the pre-emergency normal until the 'experience level' of the new pilots rises and they, as a body, increase their flying time and all-around experience."

"Under the peacetime program," it was pointed out, "safety was a primary consideration and it was stressed at all times in connection with military training and operations. Under the existing emergency conditions, the stress must be shifted. Safety, while still stressed as of major importance in all types of operations, must become secondary to the carrying out of missions which are essential to the realistic training of combat pilots. In other words, while flying personnel must be conserved, pilots and flying crew members must be trained increasingly in the execution of military missions and the use of high-speed modern equipment under emergency conditions."

Neutrality and Aviation

(Continued from page 1)

necessarily be taken in the immediate future, but whenever the war demands.

The Navy's plans involving Export, exclusively revealed by AMERICAN AVIATION, have been in the discussion stage for the last few weeks, and have been handled only through the office of Adm. Towers, Chief of the Naval Bureau of Aeronautics.

Although denying that thought has as yet crystallized on the matter, the Navy officially informs this magazine that such a plan—admittedly in its earliest stages—is "not illogical" and that more information might be expected on it at a later date.

War developments make a fast over-ocean transport service mandatory for the Navy. With Export looking forward to receiving delivery on its flying boats—claimed to be superior to previous craft of this type—within a few months, the Navy would take actual ownership of the ships, with Export acting as operator in behalf of the Navy. Actually, under present contract terms, the Navy can take over the Sikorsky planes at any time.

Export officials—conscious that talking runs contrary to the Navy's close-mouthed policy—are mum on the whole subject. But the company, although blessed with official endorsement in Washington, has struck Congressional snags over air mail funds and is in the midst of a highly competitive situation with Pan American. Thus, the proposed "deal" is seen as a wartime solution which would enable Export to develop under the wing of the Navy and then supposedly launch a post-war commercial service.

Thus, the Export-Pan American controversy over trans-Atlantic service would be postponed until after the emergency.

Pan American's future developments are a subject of spirited discussion in aviation circles. Whether the line can hold its "empire" of affiliates and subsidiaries while concentrating on wartime activity is speculative. That it has laid the groundwork for the first "round the world" airline through wartime expansion is seldom contested.

Pan American and the Army are closely linked without a revised neutrality law. The "government-owned" planes it is soon to operate on its trans-African transport service (DC-3s requisitioned from the U. S. airlines), if free to fly into combat zones, may run into shooting.

The Air Corps Ferrying Command, long having plans for operating free of neutrality restrictions, is satisfied to have Pan American handle the South Atlantic ferrying and African transport service by itself, having enough ferrying work of its own in this country.

But warplanes, like the mails, "must go through," and should war conditions prove too much for the commercial transport company, the Ferrying Command is ready to step in as far as need be—either with additional supervision or by "taking over" completely.

During the past fortnight unconfirmed reports have cropped up to the effect that the Army might take over nominal operation of Pan American's Atlantic and Pacific routes—for the duration—under an agreement satisfactory to the airline, with the property to be returned at a fair rate of compensation after the war.

It is assumed that Pan American would just as soon let the government shoulder wartime operating responsibilities, providing post-war guarantees are made.

This would not be expected to affect Pan American's operations in Latin America, where continued commercial expansion is contemplated.

Meanwhile, Pan American is considering plans for a terminal in its trans-Atlantic air passenger service to Ireland—prohibited under neutrality act terms—instead of the more inconvenient Libson location as the only European stop. This northern route, however, isn't expected to be flown regularly this winter, due to weather conditions, mainly responsible for the Army's recent cancellation of its scheduled flights to Scotland.

Col. Grant is First Army Air Surgeon

Col. Grant

To coordinate the medical activities of the Army Air Forces, the War Dept. has created the post of Air Surgeon with Col. David N. W. Grant, head of the medical division, Office of the Chief of the Air Corps, appointed as first officer of that position.

As Air Surgeon, Col. Grant will be a member of the staff of Maj. Gen. Henry H. Arnold, head of the Army Air Forces, and will retain his position as chief of the Air Corps medical division. Col. Grant, who has been a medical officer with the Air Corps since 1930, was post surgeon at Barksdale Field, La., prior to his transfer to Washington on Oct. 1, 1939.

British Customs Survive *Even Mustaches*

British aviation cadets entering the Southeast Air Corps Training Center are allowed to retain their own form of marching, some of their commands—and their mustaches—under order of Maj. Gen. Walter R. Weaver, head of the training center. Reason given is that the minor differences in customs between British and American trainees should encourage wholesome competition between the two contingents.

Aviation Highlights Expansion

Naval Air Arm Fast Gaining More Power

THE emphasis has been on aviation in recent steps taken to make the world's strongest Navy stronger for its open warfare in the North Atlantic.

Within the past fortnight the Navy has disclosed "excellent progress" in (1) its pilot training program, (2) providing for expansion of plant facilities for airplane manufacturers, and (3) construction of its far flung air bases extending from the Arctic to the tropics.

Long Range Wings of the Fleet . . . The Consolidated 'Coronado'

President Roosevelt, shortly after transferring the Coast Guard to Naval jurisdiction, asked Congress for $449,720,000 in supplemental appropriations to strengthen further the Navy's air arm.

The extent to which aviation is improving its relative position within the Navy structure was pointed out by Sen. Scott Lucas (D., Ill.), Senate Naval Affairs Committee member, who in a Navy Day statement declared that Naval aviation expansion is running 5 to 1, as against only 2 to 1 for surface unit expansion. The same day, Sen. David I. Walsh (D., Mass.), isolationist chairman of the same committee, described Naval aviation as the "most imperative need" of the Navy today. "Real progress" has been made in developing Naval aviation, but much more must be done, he said.

Assurance that aviation will figure vitally in future Naval expansion was given by Admiral Harold R. Stark, chief of Naval operations, when he asserted that "our Navy has always used more aviation than any other major power, and this superiority in the air will be maintained in the two-ocean fleet."

A similar pronouncement came from Artemus L. Gates, Assistant Secretary of Navy for Air, who declared that "upon completion of our two-ocean Navy, our aircraft carrier strength will have been increased to a point such that the Navy will be using one carrier to every two battleships, a strength far superior to that of any existing navy. The U. S. Navy is well aware that whereas sea power once consisted of men, ships and bases, it now consists of men, ships, bases *and planes.*"

More Pilots than Planes

In a progress report on the Bureau of Aeronautics, issued late last month, the Navy Dept. indicated that for the present it has available sufficient pilots to man all aircraft squadrons in commission, with the production of pilots now exceeding the production rate of planes. As a result of the overall training effort, the Navy at the moment had 1,100 more pilots than were expected under the training schedule.

The report showed that at the end of October, the Navy and Marine Corps had 5,823 pilots, and 5,135 students under training at Naval flight centers, whereas, according to the original timetable, only 4,720 pilots were to have been available at that time.

As of Nov. 1, there were 5,100 planes in the Naval air force, 2,270 being useful combat types. These total planes on hand compare with 2,172 on July 1, 1940, and 3,476 on May 1, 1941.

The 5,000 aviation cadets in training at the 16 Naval Reserve Aviation Bases are being fed into the major training stations at Pensacola, Jacksonville and Corpus Christi, at the rate of 800 a month, the peak entrance rate under the current training program. Allowing for the usual 20% attrition, about 650 pilots will be turned out monthly, and by next Jan. 1, the total trained pilot personnel will approximate 7,300—enough to handle all aircraft which will be delivered to the Navy up to and including June 30, 1942. However, the Navy Dept. contemplates no reduction in training rate, pointing out that "the number of pilots in excess of planes will be needed to furnish the extra crews which are necessary for actual operations in an emergency or war."

The review of aviation activities showed that for the fiscal year 1942, $1,016,596,600 had been set aside for Naval aviation, including $849,243,600 for new aircraft and $106,820,000 for routine maintenance and operation. In fiscal 1941 Naval aviation appropriations totaled $452,319,950, and contract authorizations $530,000,000. Some 9,365 airplanes and 27 non-rigid airships are provided for in the total funds for fiscal periods 1941 and 1942.

Considering its program for the construction of Naval air stations and aviation shore facilities to support training and maintain fleet aircraft operations, the Navy stated that this expansion work is "progressing satisfactorily and is on schedule. From six major Naval air stations and a small number of other facilities in operation in 1939, expansion has been made to a total of 79 locations, their satellite stations and outlying facilities varying in capacity from those capable of maintaining only one squadron of patrol planes to larger units capable of supporting hundreds of airplanes."

The development program is providing a chain of Naval air stations in the Atlantic area extending from Iceland and Argentia, Newfoundland, along the Atlantic and Gulf Coast, at Bermuda, in the Eastern Caribbean, and in Coco Solo, C. Z.

In the west a similar network is under construction, stretching from Dutch Harbor, Aleutian Islands, Kodiak and Sitka, Alaska, along the western coast of the U. S. to San Diego, Cal.; in the western Pacific islands of Midway, Wake, Johnston, Palmyra, Guam, Samoa (Tutuila) and at Cavite, Philippine Islands.

Some of the widely spread Atlantic bases are now serving the Navy's aviation needs, and all will be in use early in 1942.

56 Coast Guard Planes

Transfer of the Coast Guard from the Treasury Dept. to Naval jurisdiction by Presidential decree, Nov. 1, will materially reinforce the operating forces of the Navy.

The Coast Guard air branch involved in the transfer included some 56 planes, 62 officer pilots and 200 enlisted men, plus air stations at Salem, Mass., Brooklyn, N. Y., Elizabeth City, N. C., Miami and St. Petersburg, Fla., Biloxi, Miss., San Diego and San Francisco, Cal., and Port Angeles, Wash., in addition to an air patrol detachment at Traverse City, Mich.

Martin Flying Boat Launched

With full Naval ceremony traditionally accorded men-of-war, the 67-ton Mars, world's largest flying boat, was launched Nov. 8 at the Glenn L. Martin plant near Baltimore.

At the launching, first ever conducted formally by the Navy, Artemus Gates, Assistant Secretary of the Navy for Air, stated that the newly named Mars "and similar ships will add greatly to our Navy's growing strength."

Glenn L. Martin said his company had a design for a flying boat almost double the size of the Mars "which will carry a load of 40 tons to Europe" and have a speed in excess of 300 mph. Flight testing of the Mars is expected shortly.

This Coast Guard Grumman Now Patrols for the Navy

American Aviation

The Independent Voice of American Aeronautics

Published the 1st and 15th of Each Month by
AMERICAN AVIATION ASSOCIATES, INC., American Building, Washington, D. C.
West Coast Office: Title Guarantee Bldg., Los Angeles, Cal.
WAYNE W. PARRISH, Editor
ROBERT H. WOOD, News Director JAMES H. STRAUBEL, Managing Editor
DEPARTMENT EDITORS: Eric Bramley (*Transport*); Celeste W. Page (*Defense*); Leonard Eiserer (*Civil Aviation*); Charles Adams (*Manufacturing*); David Shawe (*Equipment*); F. H. Stevenson (*Financial*); James L. Straight (*West Coast*)

SAVE TIME BY AIR

PUBLISHERS: American Aviation Associates, Inc., Wayne W. Parrish, *President*; Albert H. Stackpole, *Vice-President*; Edward J. Stackpole, Jr., *Secretary-Treasurer*
BOARD OF EDITORS: Wayne W. Parrish, (*Editor*); Robert H. Wood, (*News Director*); David Shawe, James H. Straubel (*Associate Editors*)
BUSINESS STAFF: John L. Foy, *Advertising & Sales Manager*; Clinton Rehling, *Circulation Manager*; Richard R. Patschke, *Business Manager*; James L. Straight, *Western Division Manager*, Title Guarantee Bldg., 5th & Hill Sts., Los Angeles
Publications of American Aviation Associates Inc.:

ABC

American Aviation: Subscription rates—$3 per year; $4 for two years; $5 for three years. Canada and Pan-American countries, $3.50 per year; all other foreign, $4.

American Aviation Daily: Published six days each week except holidays, dispatched by air mail. A comprehensive newsletter covering daily developments in aviation. $15 per month; $85 for six months; $170 per year. Group company rates on request. Service Bureau available to all subscribers. Robert H. Wood, *Managing Editor.*

American Aviation Directory: Published twice a year, spring and fall. Complete reference data on administrative and operating personnel of airlines, manufacturers, accessories firms and their products, organizations, schools and local operators, federal and state government agencies concerned with aviation, and related aviation interests in the U. S., Canada and Latin America. Single copy, $3; Annual subscriptions, $5. Discounts on quantity orders. Next issue Apr. 15, 1942. David Shawe, *Managing Editor.*

Fortnightly Review

(Continued from page 1)

bill is the very probable result that the United States Treasury would benefit *less* under its operation than under the presently effective and operating excess profits law. It is to be hoped that by the time the hearings are concluded, Mr. Vinson will have examined his bill realistically in the light of how it would actually operate and reach this conclusion himself.

But if *that* has its ironical slants, consider the deceit in the very title of the bill. Mr. Vinson calls it a bill to limit the profits on defense contracts to 7%, but competent experts have determined that only the most capable and careful of corporation managements could close out a calendar year with a net profit of as much as 2%. The deceit in Mr. Vinson's noble proposal lies simply in the fact that federal and state income taxes, plus a vast amount of items which are not allowable as cost items by the Army, Navy and Internal Revenue, must be paid out of the 7% "profits." The net result would be, of course, that profits would be non-existent for many companies and very slim for others.

As a matter of fact Mr. Vinson should re-name his measure to read "profit *elimination*" instead of "profit limitation," for this, in essence, is the actual result the bill would have if enacted into law in its present form. Perhaps Mr. Vinson is thinking in terms of World War I in energetically pushing his punitive measure at this time, but he should recall that since 1933 there have been not one, but many, social and economic "reforms" enacted to cut down any possibility of vast profits in current defense contracts, at least for aircraft companies.

But let it not be understood that the Vinson bill's defects rest only in financial figures called profits. The ramifications penetrate deeply into the economic and industrial life of the nation and the only conclusion that can possibly be drawn is that the taxpayers would pay much more for their defense production under the Vinson bill than they are now paying.

For example, the Vinson bill would in large part nullify the OPM efforts to spread defense contracts to smaller contractors, because small manufacturers, particularly, are reluctant to venture into a business where profits are limited. The average American business is not going to warm up to the bill's provisions that losses cannot be taken into account except when losses on completed contracts may be offset against profits on contracts completed in the same year. The aircraft industry is accustomed to rigid accounting and regulations, but the average American business is not. It is a foregone conclusion that the net result of the Vinson bill would be to reduce the number of sources of supply. This, above all, would be an outright absurdity.

Then there is the matter of efficiency in management. Today under Army, Navy and Internal Revenue regulations, the aircraft industry is outstandingly efficient. There is no waste. There is a premium on capable and careful management. Such would not be the case under the Vinson proposal. Profits based on cost invariably place a premium on inefficiency in production by paying the manufacturer a profit based upon the size of the inefficient manufacturing cost. In actual operation, the tendency would be to employ two men when one man could do the work under an efficient plant set-up. Production costs, therefore, would be increased and this could hardly be good news to taxpayers faced with carrying a tremendous national deficit for years to come.

Still another telling argument against the bill is in development and experimentation. In his position as chairman of the Naval Affairs Committee, Mr. Vinson should by this time have some insight into the genius that has built the U. S. aircraft industry into the finest in the world. The primary reason why American planes have no equals anywhere is the fact that manufacturers are able to recoup losses in developmental contracts through subsequent business with the government. Very few developmental contracts ever begin to cover the actual cost of the project and all manufacturers depend on subsequent production contracts to wipe out the developmental losses. The Vinson bill would do more to destroy the genius and initiative which are the key to U. S. aviation than any other single measure.

It was back in 550 B. C. when Aesop wrote: "Thinking to get at once all the gold the goose could give, he killed it only to find—nothing." It's an ancient and time-worn illustration, but a very apt one. Mr. Vinson and his profit-limitation colleagues would do well to heed this simple but time-tested lesson.

Two-Bit Bargaining

THERE is growing opposition to the current Army policy of dickering and bargaining with communities to force them to pay for defense establishments that are fundamentally a national obligation.

We believe local communities have an obligation to furnish air facilities of value to all types of flying and which bring passengers and revenue to their towns. But the Army's policy of bulldozing communities, even by not-so-subtle threats of leaving them out of the defense picture, is leaving a bad taste everywhere. Such a practice is not only injuring the prestige and dignity of the Army, but is placing unfair burdens on some communities whose defense protection is as important nationally as it is locally.

For two years the Army has been playing off one city against another in order to get the local people to "foot the bill" for extensive airports. More than one community, anxiously eyeing the revenue accruing from an air base, gave up its local airport with the understanding that civil flying was not to be disturbed, only to find subsequently that civil flying was ousted by the Army. Having given up its municipal field at a dollar a year or so, the city then had to develop a new airport for civilians.

What this bargaining policy has resolved itself into now is a delay in vital defense preparations. Los Angeles is a good illustration, with the Army expecting the city to acquire great quantities of land for an entire new network of airfields. The Army should develop its own defense plans in Washington and consider national defense in a national light.

Pro, Con and Otherwise

Nipping the Budd

SIRS:

Yesterday I digested the Nov. 1 issue from cover to cover and your editorial concerning Mr. Ralph Budd is not only pleasing, but to me deserving. The 'Oh Promise Me' (OPM) official publication, 'Defense,' has for months carried a section on transportation and it is amusing to see practically nothing but the rails discussed in the releases.

It was my privilege to observe the speech given by Mr. Budd recently in Des Moines, Iowa, and the thinking which flashed in my mind was similar to that expressed by you in your editorial. Probably one of the major differences in our thinking was the fact that you could express your feeling much more effectively.

Early last spring, information came to my attention that Mr. Budd had made a very fine talk on transportation, and a copy of his speech was requested. His subject was on 'Five Forms of Transportation,' but after the first two paragraphs which dealt with generalities, the entire speech was a selling argument on the value and ability of railway transportation to perform adequate service for our nation.

Anyone who does not realize the importance of all phases of transportation is guilty of having a prejudiced viewpoint. Likewise, those who are short-sighted in their favoritism for one transportation medium over another are liable to criticism. There are very few men, particularly in the rail transportation industry today, who are broad-minded in their thinking as to the present and future need for air transportation.

Why should I be telling you, when the real purpose of this letter is to commend you upon the frank editorial policy and courage to challenge? I can vividly recall the editorial which you wrote last spring commending the Sante Fe Railroad for its inauguration of a fast freight service between Chicago and the West Coast. Consistent and intelligent criticism will eventually produce improved conditions. Keep up the good work.

R. C.
Aviation Commissioner
(A MID-WESTERN CITY)

(Asked to comment on the editorial, 'Mr. Budd's Sleight-of-Hand', Transportation Commissioner and Railroader Budd politely refused—The Editors.)

●

Pursuer

SIRS:

You must have had your tongue in your cheek when you condoned and praised the action of the Civil Aeronautics Board in suddenly dropping the Marquette Airlines' investigation. If conditions warranted an investigation in the first place, then the investigation should have been pursued to the end. Whitewashing will do no good. Most lawyers will agree that Messrs. Grant Mason and George Baker showed admirable courage and wisdom in dissenting from the majority opinion. Looks to me as though AMERICAN AVIATION is losing its old independence.

JUSTICE

(To the airline official who wishes to be known as 'Justice', AMERICAN AVIATION iterates that it believes the three-man majority opinion of CAB to be a wise one under the circumstances, especially since a repetition of any evils which might have existed is unlikely.—The Editors.)

●

Doubter

SIRS:

As one taking part in the airport ground service course sponsored jointly by CAA, WPA and the Office of Education, I was interested in the item appearing on page 36 of your Oct. 1 issue headlined, "CAA Reports Trained Airport Servicemen Find Jobs Quickly."

In the article you state that some 70% of the workers trained in the airport ground service classes started six months ago have been able to get jobs immediately upon completion of their training. Then too, Gen. Connolly offers some enthusiastic quotes on the subject.

Conceding that the article is written from an unbiased point of view, may I suggest that, as with the iceberg, much of the substance is below the surface?

Maybe 70% did "get jobs immediately upon completion of their training," but were they hired in aviation? From my experience with the type of fellows in the course, I have my doubts.

I am familiar with quite a few of the students taking the course, and while most of the younger fellows are conscientious in their work and interested in airplanes, many of the students are middle-aged typical WPA'ers interested only in staying on the payroll.

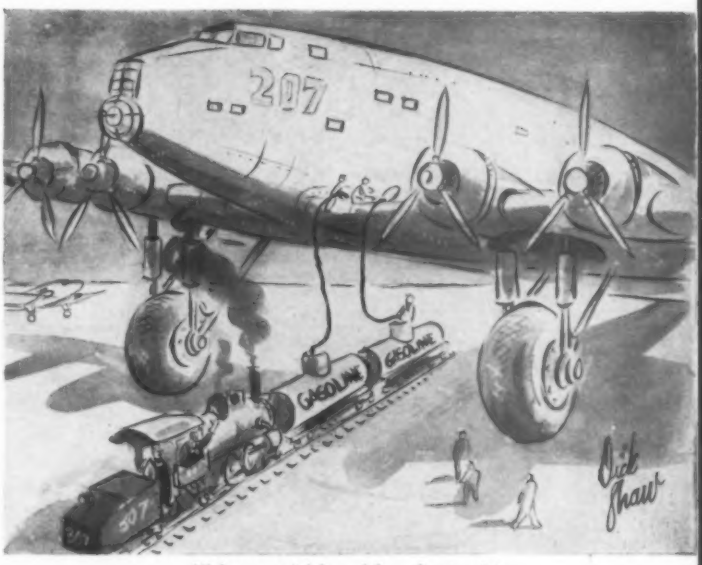
While the idea of the program is good, the spirit miscarries when as at present the students must be picked from WPA rolls. As I view it, the program could be a big boost to both aviation and youth, if the students were selected right from high school, for instance, according to their need and interest in aviation, rather than from WPA lists as at present.

"MISSOURI"

(This reader's skepticism regarding the 70% figure is unfounded, CAA maintains, answering that students placed in non-aviation jobs were not included in that percentage.

CAA also refutes the "middle-aged typical WPA'ers" charge, pointing out that an age limit of 18-35 years is set on the participants, who must be approved by the airport manager, course instructor and fixed base operator on the field before being accepted.

Admitting the program could be improved through selection of youths from a wider source than WPA rolls, CAA explains that funds for the program are available only from WPA appropriations, therefore the students, at present, must come from WPA lists.—The Editors.)



"Heavens! How Humiliating!"

Out of Bounds

SIRS:

The signed statement (Nov. 1 issue) by Col. John H. Jouett, president of the Aeronautical Chamber of Commerce, in which this estimable gentleman predicted U. S. aircraft production for the first five post-war years was indeed food for thought. He may have sound reasons for predicting the way he did, but unless all the signs are wrong, he's way out of bounds on transport requirements.

For example, Col. Jouett says trans-oceanic airplanes of all types will be needed at a rate of $18,200,000 a year. If this war is going to prove anything, it is that we will need far more than this when the shooting is over. Where are other nations going to get their large planes except from us? And how many planes will $18,200,000 build? Not very many. Our research shows that the trans-oceanic requirements will be about double the figure Col. Jouett gives.

As a matter of fact his whole transport analysis seems to us to be far short. As head of the manufacturer's trade association, he probably thought it wiser to underestimate than over-estimate but I believe his figures are ultra-conservative. Latin America itself will absorb a vast quantity after the war, if our estimating is correct, and the government will be forced to prime the domestic pump plenty in order to absorb technical and personnel facilities resulting from war expansion. If we thought Col. Jouett was correct, we'd be pretty blue around our neck of the woods.

I'd like to see other industry figures on this speculative subject.

* *

(AMERICAN AVIATION, agreeing with the writer, member of an aircraft manufacturing research department, would also like to see other industry figures on this speculative subject—The Editors.)

** Name withheld upon request

Calendar

NOV. 28-DEC. 7—International Aviation Show and Light Plane Exhibit, Convention Hall; Headquarters, Detroit Leland Hotel, Detroit, Mich.

DEC. 1—Air Line Mechanics Association, Annual Convention, Del Prado Hotel, Chicago, Ill.

DEC. 1-2—National Aviation Training Association, Annual Convention, Kansas City, Mo.

DEC. 1-5—American Society of Mechanical Engineers, Annual Meeting, Hotel Astor, New York, N. Y.

DEC. 4—Dedication of New Factory of Curtiss-Wright Corp.'s Airplane Division, Port Columbus, Columbus, O.

DEC. 17—Institute of the Aeronautical Sciences, Wright Brothers Lecture, "New Pathways in Aeronautical Theory," by Richard Southwell, Professor of Engineering Science, Oxford University, England; at the Pupin Physics Laboratory, Columbia University, New York, N. Y.

JAN. 9-11—All-American Air Maneuvers, Municipal Airport, Miami, Fla.

JAN. 10-11—Dedication of Bomber Assembly Plant to be Operated by North American Aviation Inc. at Fairfax Airport, Kansas City, Kan.

JAN. 12-16—Annual Meeting and Engineering Display, Society of Automotive Engineers, Book Cadillac Hotel, Detroit, Mich.

JAN 27.—Institute of the Aeronautical Sciences, Honors Night Dinner, Hotel Waldorf-Astoria, New York, N. Y.

JAN. 28-30—Institute of the Aeronautical Sciences, 10th Annual Meeting, Pupin Physics Laboratories, Columbia University, New York, N. Y.

APR. 23-25—5th Annual Southwest Aviation Conference, Hotel Muehlebach, Kansas City, Mo.

APR. 23-25—Women's National Aeronautical Association, Annual Convention, Hotel Phillips, Kansas City, Mo.

Bookshelf

THE POETRY OF FLIGHT: An Anthology, Edited by Selden Rodman; Duell, Sloan & Pearce, 270 Madison Ave., New York, N. Y.; 190 pp.; $2.50.

Since the first dream of flying up to the present-day "Flying Wing" and the B-19, the "miracle of flight" has held more fascination for man than can be defined as adventure, commerce or science. Even a "layman" flying from New York to Chicago in a huge transport lets fall his copy of *Time* to watch the sunset show of riotous and unbelievable color in the cumulus clouds below the ship, to study the workings of the ailerons on his wing side and to reflect on this empire of the sky through which he moves so swiftly.

He is inarticulate. He knows nothing of the science of flying nor of the intricate machine in which he is sealed.

Mr. Rodman editor of *Common Sense* magazine, has brought together in his anthology—the first of its kind—a group of writings by men of the air who have successfully translated their experiences, feelings, thoughts and knowledge about this "new frontier." That what they have to say is for the most part poetry regardless of its prose form may be due to the hold that the air has on these men.

"The moral basis of the poetry of flight," writes Mr. Rodman in his introduction, "is in the airman's awareness of a pure medium, of a new instrument without terrestrial limitations, of a perspective of the earth seen whole."

"Who is this airman? He is a familiar of science—depending on science's most delicate calculations, confirming or rejecting its hypothesis—but no scientist. He is forever shifting and weighing the most stupendous landscapes and seascapes and skyscapes with his eye, rehearsing and balancing the most intangible forces in his hand—but is no artist. He is certainly not a legislator: lawyers are notorious at hangars: try to impress upon a 'logical' mind that speed and height are the surest safety! He is the world's freest man, and yet its most dependent—depending for his very life, as even a seaman does not, on obedience to codes, care for minutest details, reaction to stimuli. Though he cannot function at all without the most formidable network of machine-shops, searchlights, pipelines, control towers, directional beams and world-wide weather reports—he lives on the very margin of civilization, alone, above all this organization, in the sky."

An airman himself, Mr. Rodman has included in his excellent anthology the writings of Fleming MacLiesh, T. E. Lawrence, Anne Morrow Lindbergh, Antoine de Saint Exupery, Milton, Leonardo da Vinci, Maurice Maeterlinck, Robinson Jeffers, W. B. Yeats, Shakespeare, Walt Whitman, Wolfgang Langewiesche and C. G. Jung.

—J. G.

●

33 LESSONS IN FLYING, by Jay D. Blaufox; Coward-McCann Inc., 2 W. 45th St., New York, N. Y.; Over 100 line cuts; 319 pp.; $2.50.

Recalling his own great need, the author, formerly a lieutenant in the RAF, makes the reader feel he is standing in his presence as he hears talks on aviation instruments; on taking a plane off and landing it safely; flying in fair weather and foul; high altitudes, storms, fogs and clouds; how to care for his engine; how to fly and land a seaplane as well as a landplane.

The lessons follow closely the Gosport System of Flight Instruction now in use in the Army, Navy and civilian flying schools throughout the country.

The book contains more than 100 line cuts by C. B. Colby, editor of *Air Trails*.

ELEMENTS OF AERONAUTICS, by Francis Pope and Arthur S. Otis; World Book Co., Yonkers-on-Hudson, N. Y.; 350 figures; 660 pp.; $3.40.

The author's object in preparing the work has been to provide a course that will make feasible the immediate introduction of a study in aeronautics into any high school. Among the features designed to make the book highly usable as a textbook are the folowing:

It is comprehensive; it is written in language that any high school student can understand; practice material is provided; there are adequate aids for the teacher; the text prepares the student for the CAA examinations.

Pope, a TWA captain, has been flying for the line since 1935; Otis is a prominent private pilot and plane owner.

In an introduction by Al Williams it is said that this text "is what has been needed for a long time: aeronautics interpreted not in technical and advanced terms, but in everyday American language used by the man-in-the-street and his son. Many books have been written by flyers on how to fly; but, so far as I know, this is the first complete textbook covering the science as well as the art of flying that has been written in the language of boys and girls in their 'teens.

I can think of no better combination of authors to produce such a work as this than an experienced educational expert, a man whose interest in aviation is genuine and active, and a transport pilot who can offer direct-from-the-cockpit points of view."

●

WAR WINGS, by David C. Cooke; Robert M. McBride & Co., 116 E. 16th St., New York, N. Y.; Over 150 photos; 218 pp.; $2.75.

In concise descriptions the author here explains the purpose of fighters, bombers, seaplanes, etc., and describes and illustrates every type of plane in active duty both in the American air service and in the Royal Air Force.

So, if you want to know what any plane looks like, how far it flies, how many guns it carries and what duty it performs, *War Wings* gives most of the answers.

The author is associate editor of *Flying Aces Magazine*. A forword was written by Al Williams.

●

AIRCRAFT DESIGN SKETCH BOOK, compiled and published by Lockheed Aircraft Corp., Burbank, Cal.; available from Aero Publishers Inc., 120 N. Central Ave., Glendale, Cal.; 134 pp.

The purpose of this loose-leaf volume is to give to the designer a collection of ideas, in sketch form, that will stimulate his own creative and inventive mind.

In a preface written by Hall L. Hibbard, Lockheed's vice president and chief engineer, warning is given that "the ideas as sketched in this book should not be bodily lifted, because by so doing the purpose of the book is defeated, and we would find ourselves not only standing still but actually going backward as far as design is concerned.

The three parts of the book are named: Part 1, Major Breakdowns; Part 2, Complete Aircraft; and Part 3, Miscellaneous.

●

'WE MADE A MISTAKE'—HITLER, by Lucien Zacharoff; D. Appleton-Century Co., 35 W. 32d St., New York, N. Y.; 213 pp.; $2.

In many respects this is a fascinating and informative book. Its title, of course, comes from Hitler's recent admission that Germany didn't know how gigantic the preparations were that the Russians had made for war.

The author is a native of Russian Ukraine and is an American citizen. He has written considerably for American publications. As fresh as today's newspaper headlines—and as readable—the author presents the Russian viewpoint throughout and it is only to be hoped that the large amount of documentary and other evidence which he uses is authoritative. If so, he has access to sources not ordinarily open.

With absolute confidence of an ultimate Soviet victory over the invaders, the author discusses the Soviet resources and technical advances in a knowing manner. Particularly intriguing are his chapters on the Red air force, parachute troops and the German air forces. Mr. Zacharoff may be overly optimistic concerning the extent of German penetration, but his book is quite engaging and enlightening.

—W. W. P.

●

AIR MAIL PAYMENT AND THE GOVERNMENT, by Dr. F. A. Spencer. Published by the Institute of Economics of The Brookings Institution, Washington, D. C. 316 pages and appendix. $3.

This is the most complete and authoritative volume ever compiled on the history of government air mail rate-making procedure. That it is up to date is proved by the fact that the author discusses certain aspects of cases not yet decided by the Civil Aeronautics Board. Dr. Spencer, a graduate of Northwestern University, Princeton Graduate School, and a Brookings Fellow, spent over three years compiling his material. Now employed by CAB as an economist, Dr. Spencer holds a commercial pilot's certificate and is a Second Lieutenant in the Air Corps Reserve. This book should be a "must" on the list of everyone interested in the air mail rate picture. (See complete story elsewhere.)

●

MACHINE TOOLS IN AIRCRAFT PRODUCTION, by R. R. Nolan; Pitman Publishing Corp., 2 W. 45th St., New York, N. Y.; 54 illustrations, 158 pp.; $1.50.

The author, superintendent of tooling for Northrop Aircraft Inc., has prepared this book to acquaint the vocational student, the beginner or the young mechanic with fundamentals of aircraft machine tools and the underlying theory of this application.

"The student or beginner of today may well be the executive of tomorrow upon whose knowledge of progressive manufacturing methods the development of the industry will depend," the author states.

"If he can be made to understand that basically all machines are simple, then he will realize that the successful exploitation of those few principles depends entirely upon individual knowledge-resource and ingenuity."

Advisory editor during preparation of the book was Prof. Alexander Klemin of the Guggenheim School of Aeronautics, New York University.

Roll Out the Starters

To Swing Music at Jack & Heintz

AIRCRAFT starters are rolling out ahead of schedule to the rhythm of swing music at the Bedford, O., plant of Jack & Heintz, Inc., and the whole scheme offers claims for the type of morale building sought by defense officials in Washington.

The firm, headed by slight, graying and shyly smiling William S. (Bill to everybody) Jack, started a year ago with 30 employes and a bagfull of unique, but apparently highly productive ideas. It now has slightly less than 600 employes working full blast and without a hitch on a $15,000,000 backlog in War Department orders.

Bill Jack tries to give credit for the firm's rapid growth to his engineer-partner, Vice-President Ralph Heintz, who passes the buck right back to its place of origin, the spark plug firm president who became a die sinker at high school age, and was a messenger boy, a magician's helper, and later the business agent for a union.

The former die sinker may have borrowed a few tricks from the magician he once served or perhaps he relied on his labor experience in guiding his new business through its rapid and continuing growth.

At any rate, workers can get a cup of coffee from any of the several urns throughout the plant, at any time they feel the need. They can listen to phonograph records four hours a day over a public address system. There is a free banquet every month for all employes, a bowling league, high wages, bonuses, and during his 20 hours a day in his shop, Bill Jack is hatching plenty of plans to keep his workers busy and contented when the present period of emergency production is ended.

Bill Jack

Right now, however, employes of the plant are chiefly concerned with living up to the company's theme song, played to the tune of "Beer Barrel Polka" by the organization's orchestra at the monthly banquets. It is, "Roll Out the Starters."

Record Output at Republic

Republic Aviation Corp. delivered more combat planes to the U. S. Air Forces in October than it did during the entire first six months of the year, Ralph S. Damon, president, announced recently.

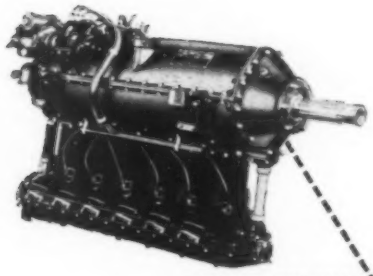
Obituary

HOWARD LONG, treasurer and director of New York & Bermudian Air Line, died at his home in New Jersey on Oct. 22.

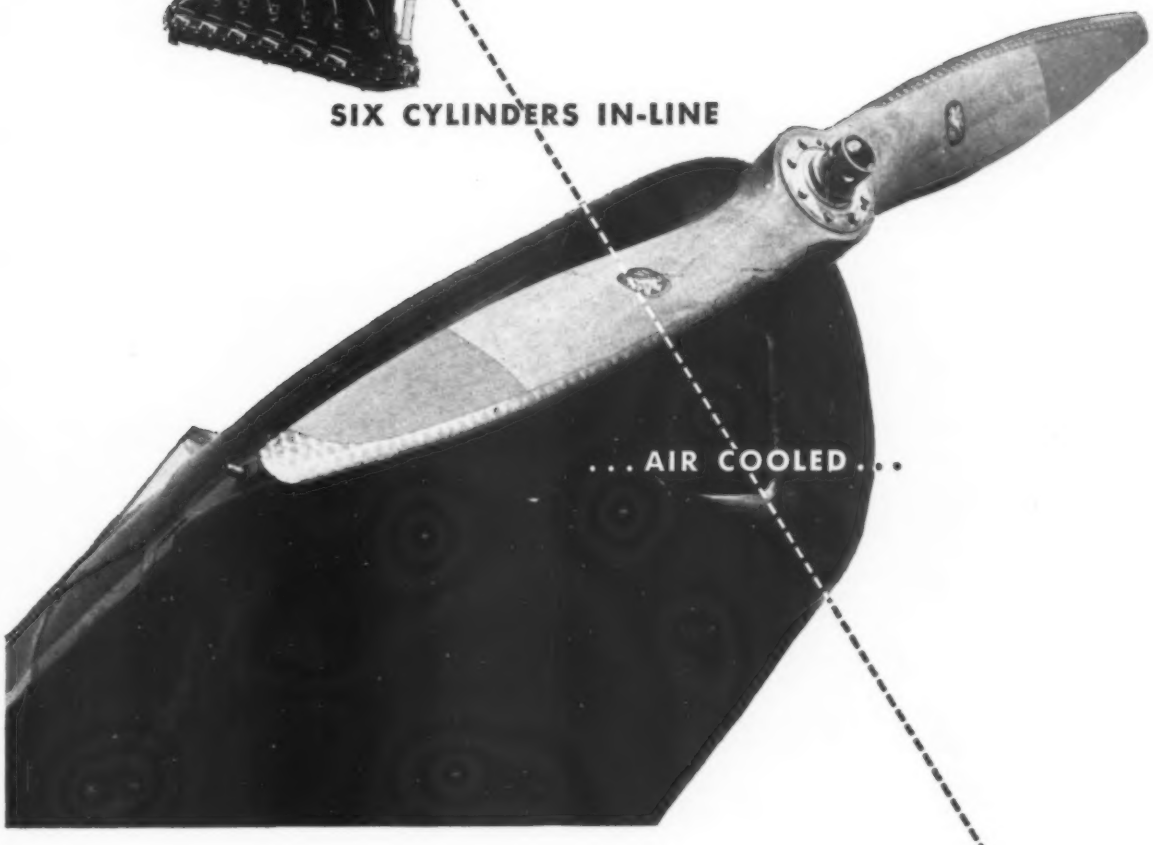
DR. FREDERICK S. REDFERN, 74, father of Paul Redfern, died at Columbia, S. C., on Nov. 7. The younger Redfern was lost in Aug. 1927 on a flight from Brunswick, Ga., to Rio de Janeiro.

MRS. HANNAH ROSENDAHL, 83, mother of Capt. Charles E. Rosendahl, the Navy's expert on lighter-than-air ships, died at Cleburn, Tex., on Nov. 6.

RALPH VIRDEN, 43, test pilot for Lockheed Aircraft Corp., died Nov. 4. He was killed while testing one of Lockheed's P-38 "Lightning" interceptors.



SIX CYLINDERS IN-LINE



. . . AIR COOLED . . .

UNDER POSITIVE PRESSURE

Positive air pressure beneath Ranger's trim cowling assures uniform and effective cooling for the six cylinders of its in-line engine. More than 1,000 Fairchilds powered by Ranger—flying in all temperatures from Canada to the tropics—operating under the severe conditions of the present emergency—are proving *in practice* the dependability of Ranger streamlined power.

With Ranger there can be no compromise with quality

RANGER

AIRCRAFT ENGINES

FARMINGDALE, LONG ISLAND, NEW YORK
DIV. OF FAIRCHILD ENGINE & AIRPLANE CORP.

Recognizing Untapped Resources . . .

Aircraft May Adopt Woodworking Industry

Plywood Holds Spotlight In Company, Federal Research Laboratories

THE American woodworking industry might conceivably become the adopted child of Aircraft, with the aeronautical use of plastic-plywood molded veneer and laminated wood developing under pressure of wartime restrictions on strategic metals.

The trend toward more extensive use of wood products in aircraft construction—urged by several industry and government authorities—might prompt a revival of wood airplanes, although the wood used would appear far different than that known in aviation's early days.

With stepped-up plane production schedules the aircraft theme of the moment, greater utilization of wood, may play a vital role in the defense effort.

Wood materials have been developed for possible use in fabricating:

- Completed airframes
- Gliders
- Propellers
- Components

Glenn L. Martin, president of the aircraft firm bearing his name, has indicated interest in the use of plywood in aircraft. He reported recently that as a result of studies made by his company over a "considerable" period of time, it was found "that the modern type of wood and plywood construction, utilizing the waterproof synthetic resin glues, offers a very definite possibility toward the acceleration of the present aircraft defense program."

Airframes

Although entire airframes of certain trainer airplanes, private ships, are manufactured from such wood material, Martin does not propose that this be done in combat types, but rather that such parts as bomb-bay doors, wing tips, flooring, fixed tail surfaces and other independent units of the structure be so constructed.

"The manufacture of such units from wood and plywood would tend," Martin said, "to relieve the present aluminum alloy situation, and at the same time would bring into the defense program an industry whose resources of labor and material have not as yet been tapped to any appreciable degree."

Woodworking establishments, with their hundreds of woodworkers, cabinet makers, pattern makers, and coach makers, could be given a place in the war effort, thus releasing large numbers of machine tools and metal workers for engine and propeller production.

Furniture Maker Aids Beech

Already, a Grand Rapids, Mich., furniture concern—Berkey & Gay Furniture Co.—through its aircraft division, is doing engineering work preparatory to production of wing panels for Beechcraft planes, it is learned. Allan H. Lockheed, pioneer aircraft designer, is general manager of Berkey & Gay's aircraft division.

The Civil Aeronautics Authority recently gave its approval to a trainer plane made of thin, laminated plywood, which its manufacturers claim is 20% lighter than a metal plane and can be produced in quantity without machine tools or highly skilled workers.

Gliders

"The spectacular use of gliders in last spring's invasion of Crete has centered growing attention on this form of aviation." says George W. Trayer, chief of the Division of Forest Products, U. S. Department of Agriculture. "An Illinois manufacturer of gliders is using Sitka spruce ribs for wing skeletons and birch plywood as a partial wing cover in combination with a metal fuselage," he announced.

Trayer should know something of the possibilities of wood products in aircraft, for his division, through its Forest Products Laboratory at Madison, Wis., is assisting privately-owned laboratories and government agencies in the investigation of uses of wood products for defense needs.

Further use of wood-impregnated plastic in gliders bounced into the news recently through a Navy Department announcement of orders for four plastic-plywood transport gliders with a carrying capacity of from 12 to 24 men for use in a new Navy glider training program. The large craft will be built by Snead & Co., Orange, Va., and Allied Aviation Corp., of Baltimore.

Development of 'Compreg'

The government laboratory at Madison is working on a product known as "compreg" or "compregnated wood"—treated plywood—which can be molded to form coverings for wings and fuselages. The material can also be used in forming structural parts of a plane. It has a superior smoothness to metal and has advantages over metal in simplicity of manufacture.

"Compreg" takes a very high polish. Plate glass rates 100 in smoothness, and the new wood material rates about 70 in relation to plate glass. In addition, it can be made in any color. The coloring matter can be incorporated at the time of manufacture, so that the color is permanent and will not need refinishing.

The material is fully as resistant or more resistant to fire than aluminum alloy; it eventually burns but it has a lower combustibility than wood.

Enough has been done in plane manufacture with this or similar materials, involving the "compreg" principle, to indicate that it has practical possibilities.

Propellers

Probably the most promise in wood propeller blades lies in other experiments being conducted at the Madison laboratory, where investigations of the variable density of wood are being conducted in an attempt to find something more durable and efficient than ordinary wood propellers.

While the British and Germans have manufactured propellers for modern high-powered aircraft engines from compregnated plywood, the U. S. development of this process is superior to anything yet produced abroad, according to Trayer, and its application, not only to propellers but to other plane parts, is under investigation.

Lab Studies Glues, Resins

The federal laboratory is also studying and developing the synthetic resins, glues, glue-setting formulae and other processes which make possible the application of these materials to aviation.

Plywood, when it is compressed and impregnated with other materials, has lost many of the characteristics of wood and has taken on other characteristics so that it is actually a plastic rather than a wood. It is this "compreg" which experts of the Forest Division believe has a great future in aviation.

Trayer states that possibly the most important development affecting wood that has been brought on by the pressure of war is the growing use of plywood for wings and fuselages. Virtually every airframe manufacturer in the country has recently exhibited keen interest in the possibilities of mass production of molded plywood planes. Many firms have begun their own research programs.

In August, the representatives of 23 firms met at the Forest Products Laboratory to gather all information available concerning plywood and other modern forms of wood adaptable to airframe construction.

"Metal shortages have prompted this return to wood planes," Trayer asserted. "And, fortunately, much spadework has already been done. New processes of wood treatment to safeguard against fire, water, and decay and at the same time make it

Latest Developments in Plywood

LATEST PROJECTS and developments of the Forest Products Laboratory at Madison, Wis., point not only to a greater use of wood and plywood in aviation as a substitute for metals during the emergency, but indicate also competition with metals in the post-war period, George W. Trayer, chief of the Department of Agriculture's Forest Products Division, indicated to AMERICAN AVIATION last week.

Latest developments in plywood were outlined by Trayer as follows:

(1) The laboratory is making progress in the development of a variable density propeller (made of compregnated plywood) for high-powered aircraft.
(2) Engineers at the laboratory are experimenting with a propeller molded in one operation which would cut manufacturing time considerably.
(3) Resin bonded three-ply plywood with a total thickness of 1/32" and 1/16" is being shipped to England for wing and fuselage coverings.
(4) The Division hopes that both hard and soft woods may be used in aircraft plywoods, considerably expanding the potential supply.
(5) While Sitka spruce is generally used for aircraft plywood, Douglas fir makes a good substitute, averaging only six or eight pounds heavier than spruce in a completed plane.
(6) With present glues and resins, laminating and splicing of spruce for aircraft work can be done satisfactorily.
(7) OPM officials are planning a check of supply and production capacity of Sitka spruce to determine the amount available for war needs.
(8) The laboratory is making a general study of plastic plywoods for aircraft to determine properties, reactions.
(9) As a result of requests by the Army, Beech Aircraft trainers (using some plywoods) are being studied.
(10) Tests show cold-setting types of glues (used in assemblies, joints) are now as strong as casein glues and have much greater durability.

The laboratory has set up a department to prepare information on wood and plywood for airframe manufacturers on the basis of information made available by research engineers.

Morrow's New Plywood Training Plane Boasts Characteristics of Combat Types

SUCCESSFUL completion of initial test flights of the Morrow Victory Trainer by the veteran test pilot Vance Breese, focused attention this month on the new plane—built almost entirely of plastic-bonded plywood.

Developed by Morrow Aircraft Corp., San Bernardino, Cal., the 175-hp. Lycoming-powered Victory Trainer features military-like performance characteristics coupled with construction materials that are readily available from the timberlands of the Pacific coast. According to company officials, the plane met all expected performance figures, which exceed by over 50% the speed and performance of conventional type civilian training planes.

According to Howard Morrow, president of the firm, the plane is the first civilian pilot trainer with military type retractible landing gear, which results in an increased speed of over 30 mph.

The smooth rivet-less skin of the fuselage and wings contributes to the high performance of the plane, which is achieved with the six-cylinder Lycoming engine. Despite the high speed of the plane (top speed, 165 mph.), the use of landing flaps gives a landing speed of 55 mph.

Workers formerly employed in the furniture or allied wood product industries are available for manufacture of the craft due to curtailed production in those fields.

A minimum of training will be required with the new laborers, it is believed, to produce planes through the Morrow process.

The Victory trainer has a wing span of 30 ft. 4 in., an overall length of 25 ft. 4 in., a height of 7 ft. 9 in., and a weight empty of 1,656 lbs. Payload consists of two pilots, parachutes, gas and oil for a maximum of 1,000 mi. range, and the necessary flight and radio instruments.

to the tail, the fuselage skin consisting of inner and outer molded sections of plywood, attached with resin glue.

The full-cantilever wing consists of a continuous section, to which the fuselage and outer wing tips are bolted.

welded tubular steel, and rubber vibration dampeners support the horizontally opposed engine.

Explaining the method of fabrication used in the Victory Trainer, the Morrow concern released the following statement:

"Based on the research carried out by our engineering department, we have developed a process of treating plastic-bonded plywood that makes it practically impervious to water, fungus growth, separation of the wood, and is fire resistant. Special methods have been perfected for molding large sheets of this material, with the result that the outside of the fuselage consists of only two shells—one for each side. The same is true of the wing leading edge, which is formed and ready to fasten in position when removed from the presses."

Principal use to which the plane will be put, Morrow believes, is for the training of secondary students enrolled in CPTP.

Cruising speed at 2/3 power output is 145 mph.

Some of the features of production and assembly of the trainer are as follows:

Laminated wood bulkhead rings, plastic-bonded with new type resin glues, are set in jigs, to which spruce stringers are attached longitudinally.

Over the fuselage are stringers, which run from the engine firewall

Covering of the wing and the tail surfaces is of plastic-bonded plywood, attached to the stiffeners and ribs with resin glue.

Tail surfaces are constructed and finished in the same manner as the wing.

Cockpit enclosures are a permanent part of the plane, formed from Plexiglas and Lucite over the laminated bulkhead rings.

Engine mount is constructed of

---

moldable, smooth, tough, and unprecedentedly strong, are now available."

Components

Proof that a large share of the research on new materials is being done by the aircraft industry and allied organizations was shown in the Sixth Annual Plastics Competition, sponsored recently in New York City by *Modern Plastics Magazine*. The defense influence was dominant at the show, with plastic aircraft components holding the spotlight.

Senator Robert M. La Follette of Wisconsin, appearing recently before a Senate subcommittee, said he understood that private companies interested in wood materials have "reached the point now where they are much encouraged to believe it may not only be possible to use this material for the hub caps of wheels, but also for propellers and perhaps also for wings—not only for training planes but they believe it may be entirely possible to use this material in combat planes.

Stimson, Knudsen Statements

Secretary of War Stimson, in a letter introduced by Senator La Follette, said:

"While for the present wood is used in aircraft only for the construction of training planes, we do not want to overlook any structural material for combat planes that has possibilities of exceptional surface smoothness, high strength for its weight and particularly that has mass-production possibilities.

"With this in mind we are interested in wood and plywood not only in natural form but particularly with its properties modified by impregnation with synthetic resins and compression."

Director General Knudsen of the Office of Production Management, in a letter also introduced by Senator La Fallotte, said "Our Aircraft Section and our Materials Branch have made a comprehensive analysis of the problem of finding substitute materials for certain minerals used in aircraft production and have recommended specifically increased research in wood and plywood by the Forest Products Laboratory."

• • •

Langley Plywood is Fixed to Pre-fabricated Frame

THE NEW process of fabrication developed for production of the plywood lightplane constructed at Port Washington, N. Y., by Langley Aviation Corp. (announced by AMERICAN AVIATION Nov. 1), departs from the traditional practice of bending prefabricated sheets of plywood and attaching them to a completed framework. Instead, thin strips of plastic-treated veneer are formed over wood molds, into integral units comprising both the structure and skin.

The molded plywood parts used by Langley are multiple layers of mahogany veneer of uneven number to prevent warping, from 1/64" to ⅛" in thickness, bonded together into a single structure by plastic compositions, impervious to heat, cold and dampness. Fuselage, wings, control surfaces and cowling are joined without the use of nuts, bolts or screws.

While on the molds, the formed parts are placed in a steam pressure chamber for 60 minutes or less. Parts to be treated in the chamber are covered with canvas and enclosed in a rubberized bag for protection. The steam treatment softens the plastic, binds the layers of veneer, welding them into a rigid, and exceptionally strong unit which requires a minimum of structural members.

The product is said to have successfully withstood tests for weakness at temperatures ranging from —40 degrees to 160 degrees F. Plastic plywood is resistant to corrosion by acids, alkalis, salt water and fungus, and likewise is highly flame resistant.

The Langley system of fabrication reportedly lessens the problems of labor and tooling. Carpenters and woodworkers with their regular tools are all that are required.

• • •

Plywood Ercoupe Readied for Tests

THE FIRST "spin-proof" plastic-plywood plane, an experimental job, is expected to be in the air in the vicinity of Engineering & Research Corp., Riverdale, Md., around Dec. 1. All preliminary tests have been completed successfully, and output will be 50 to 60 a month, according to the company.

The new plywood plane will be essentially the same as the original all-metal Ercoupe, is designed for the same spin-proof, stall-proof characteristics, with plywood substituted for most of the aluminum sheet used on the original model.

The new plane, somewhat heavier, being of plywood, and also because of buyers' demands for more equipment, may take a 75 or 80-hp. engine rather than the 65 now used in the Ercoupe. Experiments with the heavier engine are now being conducted.

Experiments with the plywood used by Engineering & Research

(Turn to page 27)

The Birdmen's Perch

The editor's chair is a hot seat! Never before in the long career of "The Perch" have we received such scathing letters as have lately been written on the subject of "harder problems." The customers say we are sissys. They say the problems aren't *half* tough enough. And to make their point clearer, they send in problems that really are tough. Can you top this month's? Send 'em in, fellows . . . the more the merrier!

Major Al Williams, alias, "Tattered Wing Tips,"
Gulf Aviation Products Manager, Gulf Bldg., Pittsburgh, Pa.

DEPT. OF INFORMATION

We suggest you cut out the following and paste it in your helmet. It is contributed by Walter A. Biddle, Ground Instructor at Cutter-Carr Flying Service, Albuquerque, New Mexico. Them's words of wisdom, Mr. Biddle!

DON'T EARN YOUR WINGS
Get A Fitted Pair Free From St. Peter

Always take off with a cold motor, you waste so much gas warming the engine.
Don't fasten the safety belt, that's for sissys.
Don't look for other planes in the air, they will miss you most of the time anyway.
Practice your steep turns over the girl-friend's house; she will think you are the cutest corpse.
Always fly into a thunderstorm, it must be interesting for few ever come back after they go into one.
Stretch your glides to the last inch, if you don't reach the spot you will make a nice one anyway.
Your gas gage is always correct, only *old* pilots look in the tank to check.
Pull the nose very high in slips, it gives the ground observers a bad case of the jitters.
When approaching a strange field, sneak in low and straight, it is such a surprise to the local flyers.
When a plane is placarded for a maximum speed, see if you can't squeeze a few more miles out of the old crate.

Don't have your parachute packed every 60 days, that's just a racket thought up by the chute packers.
When taking your girl for her first ride, pull a forced landing; the motor usually catches and what if it doesn't.

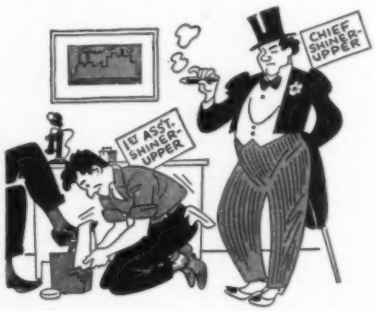
THIS MONTH'S BRAIN TWISTER

Well, here's one of the fellows who thinks the problems should be much tougher. This one is from a Pvt. (Sgt., by now, we hope) at Selfridge Field. Send in your answers, guys, and send in a tougher one if you can!

The pilot of a plane flying North began a turn over an East-West highway maintaining the same bank and altitude throughout a 360° turn. There is an East wind blowing at 30 m.p.h. When the pilot had completed the turn he noticed that he was 500 feet further West along the road. If the speed of the plane was 180 m.p.h. what was the radius of the turn?

WE DO IT UP *EXTRA* GOOD!

Once upon a time we had a shoeshine man here in the office. Not just an ordinary shoeshine man, either—this fellow was very superior. He carried an assistant with him who first shined the shoes. Then our superior boot-black *shined the shine.* Yes, the result was wonderful.



We tell you this because here at Gulf we practice just about the same trick in refining Gulfpride. We *shine the shine.* In other words, we give Gulfpride an extra something with a special refining method of ours—the Alchlor Process. Because we started with the finest crudes, and because this Alchlor Process takes out *more* of the carbon-and-sludge-makers, the results are wonderful—just like the shoe shine.

Ask the next pilot you meet, how Gulfpride has acted in his plane. He'll tell you it's the finest protection an airplane engine could ever get!

THIS MONTH'S WHOPPER

Dear Major:

Being of a rather conservative nature I was loath to discount some of your stories on the merits of G.A.G. To we flyers up here in the bush that liquified dynamite is something we hear a lot about but cannot purchase.

One day last summer we were diamond-drilling a claim on one of Ontario's many land-locked lakes. Our Waco supply ship was a day or two overdue with our supply of gas for the drill motor. Towards evening, however, an American who was touring around in search of some exclusive fishing chanced to drop down on the lake we were operating from. As our gas supply had run out and the drill stopped operating I went down to the shore and started a conversation. When I told him what our situation was he immediately offered us a few gallons of his fuel supply to use until our plane arrived. Up to this time let me add that I had not taken seriously the claims for your "stormy petrol."

Well, we filled up the tank of our drill motor with the few gallons we had borrowed. When I spun the crank, something seemed to snap and the four-cylinder power plant started to whine like a Wright Cyclone on a test block. We were helpless, the only thing to be done was to let her run out.

Now this may sound hard to belive, but in the morning when the commotion had stopped we ventured back to the scene and found a very tired-looking drill assembly relaxing beside a perfectly cut shaft 500 ft. deep and the conventional width. When the stopping crew flew in later and I explained it to them they told me to tell it to the marines. Well, I'm going them one better and telling it to you.

A northern flyer,
Syd. Dunkley
88 Cedar Street,
Sudbury, Canada

Gulf Oil Corporation and Gulf Refining Company . . . makers of

GULF **GULF AVIATION PRODUCTS**

October Plane Deliveries Hit New Peak

Output Reported Ahead of Program Mapped in Mid-1940

By Charles Adams

WITH ANY one of four firms now turning out aeronautical products faster than did the entire industry in 1939, aircraft deliveries during October reached new heights both in dollar volume and in units of military planes produced.

While the Office of Production Management ceased issuing monthly reports in September, Rep. J. Buell Snyder (D., Pa.), chairman of the House military appropriations subcommittee, recently estimated that between 2,150 and 2,200 military planes were delivered in October, compared with 1,914 in September, 1,854 in August, 1,016 in January and 550 in July 1940 when the defense program got under way.

Ahead of Schedule

Rep. Snyder added that the industry is turning planes off the line in advance of the program mapped in mid-1940.

Other sources declare Rep. Snyder's figures are conservative and place the correct total for October at between 2,250 and 2,275.

But more significant than the rise in unit plane deliveries—which give equal importance to a trainer and a heavy bomber—is the even sharper spurt in dollar volume of aircraft products shipped. So fast is this latter increase proceeding that the dollar value of aircraft production may well be doubled in the six months betwen July and December of this year, according to Washington sources.

After hugging close to the $120,000,000 level during April, May, June and July, deliveries began soaring spectacularly and are now climbing at the fastest rate yet attained.

Shipments for August leaped $25,000,000 above the July figure of $125,000,000, while September deliveries shot up another $25,000,000 to $175,000,000. October shipments were around $195,000,000, with estimates for November and December set at $230,000,000 and $255,000,000, respectively.

Goal to Be Exceeded

Already it appears certain that the 1941 goal of 18,000 military planes and $1,500,000,000 worth of shipments, set by the Aeronautical Chamber of Commerce last spring, will be bettered by a considerable margin.

Assuming Rep. Snyder's figures for October to be correct, the aircraft industry during the first 10 months of this year has turned out over 14,700 military planes, approximately half trainers and half combat. Thus, a production of but 1,650 in each of the next two months is required to complete this year's quota.

More likely, the 1941 total will be but several hundred short of 20,000 planes (as predicted in American Aviation Aug. 1, p. 40), roughly 9% above the Aeronautical Chamber's estimate.

Better in Dollar Volume

Indications are that the industry will do even better in delivery dollar volume. During the first 10 months of this year, approximately $1,260,000,000 worth of aircraft products were turned out. To reach the $1,500,000,000 goal, shipments for the months of November and December need average but $120,000,000.

Actually, dollar volume deliveries will probably be double this rate, bringing the year's total to around $1,750,000,000, or 17% better than the Aero Chamber's estimate.

By October aircraft products were being turned out at an annual rate of $2,340,000,000, while the December rate is scheduled to exceed $3,000,000,000 yearly.

Annual unit plane output rate, according to Rep. Snyder's figures, was over 25,000 in October, and by January, if unit deliveries increase but 100 a month, the yearly rate will be approximately 30,000.

Barring new strike outbreaks and unforeseen bottlenecks, the industry seems certain to begin 1942 producing 2½ planes for every one it turned out a year before and shipping nearly four dollars worth of aeronautical items for every one delivered 12 months previous.

Consolidated Typical

Typical of many companies reporting tremendous upswings in deliveries during recent months is Consolidated Aircraft Corp.

In the pre-war year of 1939, Consolidated turned out $3,603,239 worth of planes and parts, a figure which was raised to $9,349,550 last year. In the first three months of 1941, production roughly equaled all of 1940; and shipments for the first six months ($35,930,488) were nearly four times the 1940 deliveries.

However, the most spectacular delivery increases by Consolidated have been during the past few months as has been the case with the industry as a whole.

Shipments in October, according to Maj. R. H. Fleet, president, reached a rate of $18,000,000 monthly, equivalent to half the firm's deliveries in the first six months of the year and more than in July and August combined.

This monthly rate of $18,000,000 indicates annual shipments of $216,000,000, against total output for the entire industry of $225,000,000 in 1939.

Predicting even sharper production expansion next year, Fleet estimated that by the middle of 1942 his firm would be turning out $18,000,000 worth of planes and parts every 10 working days—as much as the company produced in the first decade of its existence.

. . . As Heavy Bombers Like This Consolidated B-24 Swell Dollar Volume

Mass Flyaway of Vultee Basic Trainers Boosts Unit Deliveries . . .

• • •

Lockheed Production Achieves Record Pace

PRODUCTION at Lockheed Aircraft Corp. during the first three-quarters of 1941 broke all company records with a dollar volume output of $99,000,000, Charles A. Barker Jr., vice-president in charge of finance, announced recently.

Averaging $11,000,000 for each of the nine months, production exceeded $13,500,000 in July, August and September.

Vega Airplane Co., meanwhile, reported net sales for the nine-month period of $4,500,000, bringing combined deliveries for Lockheed and its subsidiary to $103,500,000.

Shipments of Lockheed planes and parts for the nine months considerably more than doubled the $44,936,594 dollar volume turned out by the firm during all of 1940. Production for the third quarter alone approximated $41,000,000.

While output bounded upward, backlogs and personnel kept pace, with Lockheed on Oct. 28 reporting orders totaling $279,415,000 (to which may be added a $92,000,000 contract announced Nov. 5) and Vega $254,413,000. Only last month Lockheed-Vega set a new high for the industry by hiring their 50,000th employe, and the companies are now taking on workers, "including women in many departments," at a rate of 2,000 a week.

As Vega moves into assembly-line production of Venturas and Flying Fortresses, it will add greatly to its present personnel of 11,000; while Lockheed, now employing 39,000 in the manufacture of P-38 Lightning interceptors and Hudson bombers, will expand at a more moderate rate.

• • •

Beech Delivers ½ Million In Ships in One Day

Beech Aircraft Corp., Wichita, Kan., on one day recently delivered more than $500,000 worth of aircraft to the government due to an accumulation of ships during "a few days of unfavorable weather."

During the entire year of 1936 the company delivered approximately $425,000 worth of planes if the cost of engines, propellers, and other equipment which is now furnished by the government for current production, were deducted from the price of the planes.

Executives of Beechcraft expect that by spring of next year deliveries will approximate a $500,000-per-day level on flyable days, not including Sundays.

• • •

Fisher Body Shipping Initial B-25 Sections

Memphis Aircraft Division of Fisher Body has begun shipping sections of North American B-25 medium bombers to the Kansas City, Kan., assembly plant ahead of schedule, Edward F. Fisher, general manager, announced this month.

Approximately 900 persons are currently employed at the Memphis plant making 21 different types of bomber sections, with 4,000 workers to be turning out 69 types when full production is reached. A new factory addition, which will increase floor area from seven to more than 14 acres, is expected to be ready by Feb. 1.

. . . And These Uncompleted Flying Fortresses Foreshadow Output of the Future

XUM

THREE crowded assembly lines of twin-engine, all-metal BEECHCRAFTS show the results of one year's expansion for Defense production at the Beech factory.

These results are further apparent in the following comparisons of production and related activities at Beech for October 1st, 1940 and October 1st, 1941:

Deliveries during September 1941	702% of September 1940 deliveries
Inventories of raw materials and work in process October 1st, 1941	670% of October 1st, 1940
Total available floor area	550% of October 1st, 1940
Total employees	403% of October 1st, 1940
Backlog of uncompleted work	390% of October 1st, 1940

Deliveries for the company's fiscal year 1941, which ended September 30th, are 430% of deliveries for fiscal 1940, after adjustment to a common basis. September 1941 deliveries alone are practically equivalent to total deliveries for the 1940 fiscal year, allowing for the value of engines and equipment furnished by the Beech Aircraft Corporation during 1940, and not thus furnished during 1941.

The much larger percentages of increase in deliveries and inventories than in floor space and total employees show the attainment of increased operating efficiency. Further increases in efficiency are within immediate reach, as the result of a continuous employee training and upgrading program. Present production is as yet only a fraction of the ultimate planned production level, which should be reached by March 1942. Unfilled orders on hand now total approximately 88 million dollars.

Information regarding all commercial BEECHCRAFTS known to be on the market is available from the Used BEECHCRAFT Exchange, a service maintained for the benefit of present and prospective BEECHCRAFT owners.

LET'S GO! U.S.A. · KEEP 'EM FLYING!

BEECH AIRCRAFT CORPORATION ★ 6423 EAST CENTRAL AVENUE ★ WICHITA, KANSAS, U.S.A.

BEECHCRAFT

More Billions Added to Industry Backlog By New Flood of Government Contracts

DESPITE record deliveries during recent months, the nation's aircraft manufacturers, including allied automobile firms, have watched their collective backlog mount at least two billion dollars since Sept. 1 under the impact of a new flood of U. S. government orders. (Unfilled orders for aeronautical products now exceed $10,000,000,000.)

This is revealed by OPM figures showing the award of War and Navy Dept. contracts totaling $992,511,000 in September as well as by recent Air Corps announcements of hundreds of additional orders in October and the early part of November aggregating well over $1,250,000,000 more.

Huge Net Increase

Thus, while aircraft firms turned out the record total of $175,000,000 worth of aeronautical products in September, this volume represented less than one-fifth of the new orders during the month, leaving a net backlog increase of $817,511,000. This figure would be raised somewhat by adding the comparatively small amount of foreign orders not included in Lend-Lease plus the volume of contracts placed by private interests.

That the government's aircraft purchasing has recently tended to increase sharply rather than taper off is seen in the fact that in the two months of July and September alone, orders from the War and Navy Depts. totaled $2,644,000,000, or around 46% of all aeronautical awards made by these two agencies since the defense program got under way in June 1940.

$414,000,000 to Ford

One company, Ford, received $414,000,000 worth of aircraft orders in the first part of October, while two others, Studebaker and Republic, were allotted another $140,000,000.

During the last two days of October and the first five in November, the Air Corps announced eight contracts totaling in excess of $455,000,000 in addition to scores of smaller awards aggregating millions more.

Recent Air Corps contracts of over $1,000,000 include:

ALLISON DIVISION, General Motors Corp., Indianapolis, Ind., $124,459,170, aircraft engines.

AIRPLANE DIVISION, Curtiss-Wright Corp., Buffalo, N. Y., $107,434,037, airplanes and parts.

LOCKHEED AIRCRAFT Corp., Burbank, Cal., $92,277,800, airplanes and parts.

DOUGLAS AIRCRAFT Co., Santa Monica, Cal., $78,264,093, airplanes and parts.

Turret Awards

EMERSON ELECTRIC Mfg. Co., St. Louis, Mo., $20,029,362, machine gun turrets.

GLENN L. MARTIN Co., Baltimore, Md., $19,007,247, turret assemblies.

NASH KELVINATOR Corp., Detroit, Mich., $19,503,878, propeller assemblies and parts.

PACKARD MOTOR Car Co., Detroit, Mich., $17,726,233, engine parts.

AMERICAN PROPELLER Corp., Toledo, O., $12,185,050, propeller blade assemblies.

PIONEER INSTRUMENT Division, Bendix Aviation Corp., Bendix, N. J., $10,753,723, aircraft instruments; $1,686,830, altimeters; $2,451,000, magnetic compasses and inverters.

FAIRCHILD AIRCRAFT Division, Fairchild Engine & Airplane Corp., Hagerstown, Md., $4,329,908, airplanes and parts.

Contract to Kollsman

KOLLSMAN INSTRUMENT Division, Square D Co., Elmhurst, N. Y., $2,997,565, pitot tubes, altimeters, tachometer indicators, etc.

ECLIPSE AVIATION Division, Bendix Aviation Corp., Bendix, N. J., $2,208,450, supercharger regulator assemblies.

CHANDLER-EVANS Corp., South Meriden, Conn., $1,320,877, fuel pumps.

AIR CRUISERS Inc., Clifton, N. J., $1,047,592, oxygen cylinders.

WESTON ELECTRICAL Instrument Corp., Newark, N. J., $1,206,642, indicators, bulbs and generators.

Bell Given Citation

Lawrence D. Bell, president of Bell Aircraft Corp., this month accepted for his company a certificate of achievement for success in development and production of the Airacobra fighter.

The award was one of three made by the George Washington University Law Association to manufacturers making outstanding contributions to national defense through research and invention.

Personnel on the Move

Newly elected director of Liberty Aircraft Products Corp., Farmingdale, N. Y., is **Charles R. Stevenson**, of Stevenson, Jordan & Harrison Inc., management engineers . . . **A. P. Fontaine** has been made chief engineer of the engineering and development department of Vultee Aircraft Inc., succeeding to the position formerly held by **E. G. Bruce**, who became the company's chief research engineer . . . Election of **H. O. West** to the board of directors of Boeing Aircraft Co. and the election of **J. E. Schaefer** to the board of Boeing Airplane Co., the parent organization, were announced recently. West is executive vice president of both the Boeing companies; Schaefer is vice president of Boeing Airplane and general manager of its Wichita Division . . . Kaydon Engineering Corp., Muskegon, Mich., has appointed **Harold M. Lochrane** as chief of methods and standards. The corporation specializes in the design and manufacture of large special roller and ball bearings, fittings, and ordnance parts . . . **R. W. Boise Jr.** heads Boeing's new industrial engineering department . . . **James H. McKee**, manager of Curtiss-Wright Corp.'s Propeller Division factory at Neville Island, Pa., is now director of steel blade research and development for the entire division . . . Young Radiator Co. has named **George J. Haislmaier** sales manager of its contract products division . . . Aeronautical Chamber of Commerce has appointed **Ken Ellington** liaison representative with radio and **Fanya Graham** as liaison with the motion picture industry on the West Coast . . . **Maj. Frank W. Seifert** is now eastern representative for Kinner Motors Inc. with headquarters in Washington, D.C., following a year on active duty in the office of Under-Secretary of War Patterson. Maj. Seifert was with Ryan Aeronautical Co. for three years prior to active service.

Fontaine

Election of **K. R. Jameson** to the office of vice president in charge of sales of Airplane Manufacturing and Supply Corp., Burbank, Cal., is announced. Jameson has been with Pacific Airmotive, a division of Airplane Manufacturing and Supply, since 1932. **E. H. Conerton** of New York retains the office of first vice president. . . **William H. Milton, Jr.** has been promoted by General Electric Co. to the position of manager of the plastics department. . . **Raymond C. McKinney** has been appointed superintendent of the aircraft bearing division of Cleveland Graphite Bronze Co., having left Pratt & Whitney Aircraft Division of United Aircraft Corp. where he had been for 14 years. McKinney entered the aircraft engine field in 1917 with Wright-Martin Corp. He will supervise transferring of Cleveland Graphite Bronze aircraft division into the company's new plant at St. Clair Ave. and E. 168th St., Cleveland. . . **E. D. Starkweather** has been named personnel director of North American Aviation Inc.'s Inglewood, Cal., plant, with **A. W. Hale**, another new addition to the staff, as his assistant. . . **Howard L. Hartman**, formerly assistant secretary of Pratt & Whitney Aircraft Division, has joined Chandler-Evans Corp., South Meriden, Conn., as assistant general manager. **Thomas D. Hogg**, shop superintendent of Chandler-Evans, was promoted to the position of factory manager . . .

Hartman Hogg

Aircraft Steel to Be Allocated

ALL TYPES of steel used in the airframe and accessories industries are expected shortly to be placed under the allocation system like aluminum and magnesium instead of the current priorities plan as a result of the recent meeting in Dayton, O., of some 300 purchasing agents, priorities specialists, OPM representatives and the production survey unit of the Air Corps Materiel Division.

Under the new procedure, manufacturers will be instructed to file their requirements for all types of steel, including such steel alloys as nickel and chrome, for several months ahead with the Wright Field scheduling unit. This agency will then forward the estimates to the OPM Iron and Steel section in Washington where they will be fitted into the production picture.

OPM will decide what mills are best equipped to deliver the materials required at the specified time. These mills will be instructed accordingly to allocate a certain amount of production to specific airframe companies. The airframe manufacturers will later send purchase orders to the suppliers indicated by OPM.

Industry spokesmen express encouragement over the new program which they expect to save them much anxiety and extra work. If no sabotage or strikes interfere, the manufacturers under the allocation policy will be able to count definitely on the delivery of steel products when they are needed on the dates specified, thus avoiding the need of continually following up purchase orders, shopping around for ultimate sources of supply and building up large reserves.

Dominion Eyes Output of Fewer Plane Types for Greater Efficiency

CANADA should cut in half the number of military plane types now being produced, according to Ralph P. Bell, director-general of aircraft production, who believes optimum efficiency would involve the limiting of output to an elementary trainer, a single-engine advanced trainer, a twin-engine advanced trainer, a coastal reconnaissance amphibian, a bomber and a fighter.

Such a program, Dominion sources assert, would mean continuation of production on the Tiger Moth elementary trainer, Harvard single-engine advanced trainer, Avro Anson twin-engine advanced trainer, Consolidated PBY reconnaissance, Hurricane fighter and "probably" the Martin B-26 medium bomber, "although the possibility of undertaking a four-engine British bomber is not yet ruled out."

The plan may eliminate output of the Fleet Fort, single-engine advanced trainer, Stranraer reconnaissance, Bolingbroke and Hampden bombers, Norseman "flying classroom" and Lysander army cooperation.

XUM

Strikes Persist As Government Sidesteps Issue

WITH THE Administration still failing to move forcefully against strikes, the defense labor situation generally grew worse by fits and starts during the past fortnight, while the picture in aircraft, after clearing up momentarily, clouded over again.

Sentiment for legislation to thwart defense industry walkouts, which reached new heights before John L. Lewis sent his miners back to work, temporarily subsided, with the Administration, apparently reluctant to risk losing labor's support, still attempting to handle an admittedly serious situation by persuasion and mediation. However, it is understood that the President and his advisers are trying to work out plans for some kind of group which might deal with defense labor disputes with more effectiveness than the National Defense Mediation Board.

But evidence remains that some sort of strike curb only awaits a new and expected crisis.

President Makes Plea

Early this month President Roosevelt again called for both management and labor to "stay on the job and get things made."

Threat of a general walkout of CIO aircraft workers in five eastern states was dissipated recently as the Army moved in to supervise reinstatement of striking Air Associates workers, presumably putting the lid on a controversy which has been sputtering and flaring since July 12.

West Coast Hit

Center of disturbance then moved to the west coast where the United Aircraft Welders, involved in a jurisdictional dispute with the AFL, pulled out its members at Consolidated, Lockheed and Vega and threatened to call a sympathy strike at six other California aircraft factories. Sidney Hillman, associate director-general of OPM, denounced the strike as "an outlaw, wildcat proposition," asserting that the government proposed to give the companies involved "every help" in ending the walkout.

The welders, now represented by the AFL in bargaining, seek an autonomous international union of their own within the AFL and the right to bargain for themselves under contracts which they already hold with aircraft plants. Production at the three factories hit by the strike was not delayed during the first few days of the walkout, company officials said.

Reynolds Metals Plans New Aluminum Facilities

Reynolds Metals Co. last month announced plans to construct its third aluminum plant, designed to bring the firm's total output of virgin metal to 160,000,000 lbs. annually.

Production at the new unit, to be located at Listerhill, Ala., will supplement output at plants already in operation at Listerhill and Longview, Wash.

Cessna Tells Post-War Plans for a 'Family Car of the Air'

CESSNA Aircraft Co., through its president, Dwane Wallace, has revealed plans for manufacture of a popular-priced "people's plane" to be turned out in mass production after the war.

Thus, one more firm joins Ford, General Motors and others which have recently expressed the conviction that the airplane is the next great mass production development of the age and that the collapse of the war boom does not mean the collapse of the aircraft industry.

"The key principle of the Cessna plane's design," according to Wallace, "is already frozen, but refinements will be made in accordance with improvements in engines and production methods being discovered daily.

Advanced Safety Features

"This 'family car of the air,'" he continued, "will not resemble in appearance any plane ever built. Its safety features will be far in advance of any 'fool-proof' planes yet produced, and the cost will be in the same price range as present-day automobiles. The operation expense will be much less than cars in today's low-price class.

"The plane will be easy to fly, requiring no more instruction than is necessary to learn to drive a car. Initial models will have a capacity of more than two passengers. Different sizes will be built to accommodate individual needs just as automobiles are made in coupe and sedan styles.

"If the war ended tomorrow, we would put this plane on the market in the length of time required for an automobile concern to tool up for a new model," Wallace declared.

The T-50, Cessna's five-passenger, twin-engine plane now being used as a bomber trainer, will continue to be produced and sold in peacetime for personal transport and for feeder airline service.

Production Not Begun

Wallace said he wanted it understood that no production on his family plane of the future has been started and that no model has been built, "since priorities on plant space and the scarcity of materials now vital to defense make such work impossible both from a physical and patriotic standpoint."

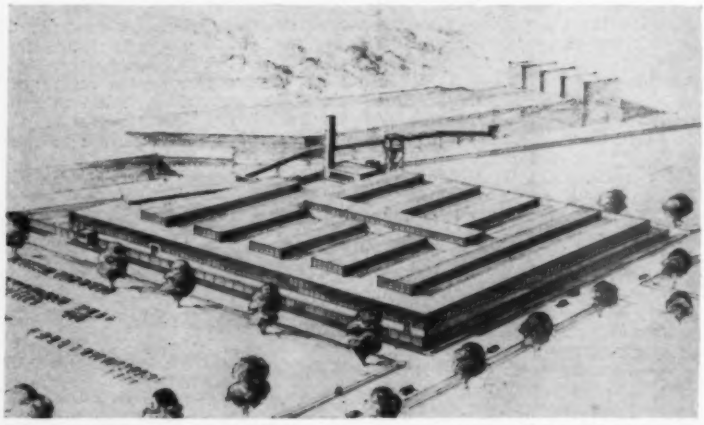
He pointed out that the thousands of young men now engaged in both civilian and military air training will constitute an immediate and urgent market for such a plane and declared that straight-line production methods, very similar to the mass-manufacturing processes used in the largest automobile factories, will be employed from the outset.

"In making this plan public now," Wallace concluded, "we feel considerations of the competitive angle should be sacrificed in order that both our employes and the public may know that we have a definite and concrete plan for the preservation of employment and the maintenance—even the increase—of our 'defense boom' plant facilities."

Boeing Meeting Schedule on Douglas Light Bombers

With approximately 5,000 men now working on the project, Boeing Aircraft Co. recently announced that its schedule for production of DB-7B light bombers (Boston III) for the British under license from Douglas is being met "on the nose."

Ultra-Modern Lycoming Addition



COVERING an area of 161,430 sq. ft., this new monitor-type building for mass line production of trainer engines is now under construction at the Williamsport, Pa., plant of Lycoming Division of Aviation Manufacturing Corp.

Featured in the project is a 540-ft., fully-enclosed, monorail conveyor system which will bear finished parts from final inspection in the new factory to the bond room in the present unit, thus eliminating time wasted in inter-plant transportation.

Present plans call for production to begin in the 380 x 425-ft., one-story structure around Apr. 1.

Jacobs Aircraft Begins Work on New Engine Unit

EASTERN U. S., received major attention in aircraft facility expansion during the past fortnight as Jacobs Aircraft Engine Co., Pottstown, Pa., broke ground for its new $13,000,000 engine plant and the Defense Plant Corp. allotted more millions to factories in the area.

Jacobs' DPC-financed unit, which will build Pratt & Whitney trainer engines under license from United Aircraft Corp., is scheduled to be completed about the middle of next year. When in full operation it is expected to require a working force of over 3,000.

$27,000,000 Backlog

Employing 1,000 men at its present plant, Jacobs is now working on a backlog of $27,000,000 worth of Canadian and U. S. orders.

Also indicating expanding activity in the engine field was DPC's announcement that it had authorized an increase of $4,974,200 in its present $3,425,000 agreement with Wright Aeronautical Corp. for additional facilities at East Paterson, N. J. Approximately $2,747,800 will be used for land improvements and buildings and $2,226,400 for machinery and equipment.

Other Commitments

Other loan agency allotments for aircraft announced recently are:

Curtiss Propeller Division, Curtiss-Wright Corp., $116,000 increase in present $1,769,600 commitment for additional facilities at Caldwell, N. J.; $1,891,500 increase in present $7,099,650 agreement for additional facilities at Indianapolis, Ind.

Vickers Inc., Detroit, Mich., $8,580,957 for constructing and equipping plant at Detroit for manufacture of aircraft hydraulic equipment.

Aetna Ball Bearing Mfg. Co. Chicago, Ill., $410,565 for machinery and equipment for production of propeller roller thrust bearings for military planes.

Julien P. Friez & Sons Division, Bendix Aviation Corp., Baltimore, Md., $380,716 for construction and equipment of plant to manufacture aircraft (meteorological) equipment.

A. W. Hecker, Cleveland, O., $199,130 for additional machinery and equipment for machining of aircraft castings and forgings.

National Supply Co., Pittsburgh, Pa., $273,536 for machinery and equipment for plant at Torrance, Cal., to be used in the manufacture of aircraft parts.

Boeing Airplane Co., Seattle, Wash., $128,900 increase in present $272,500 agreement for additional machinery and equipment at Wichita, Kan., plant for manufacture of bombers and parts.

Culver Control Goes to Beech and Yankey

CULVER Aircraft Corp., Wichita, Kan., this month announced that Walter H. Beech and Charles G. Yankey had acquired control and taken over its management. Beech is president and Yankey vice-president of Beech Aircraft Corp.

Culver moved to Wichita last year from Columbus, O., where it was organized in 1936. It has approximately $1,000,000 in government aircraft orders and several hundred thousand dollars worth of commercial contracts.

America's Future

. . . DEPENDS ON THE TRAINING OF AVIATION PERSONNEL

THIS TOWER OVERLOOKS AVIATION'S MOST DISTINGUISHED SCHOOL OF AERONAUTICS • FOUNDED IN 1929

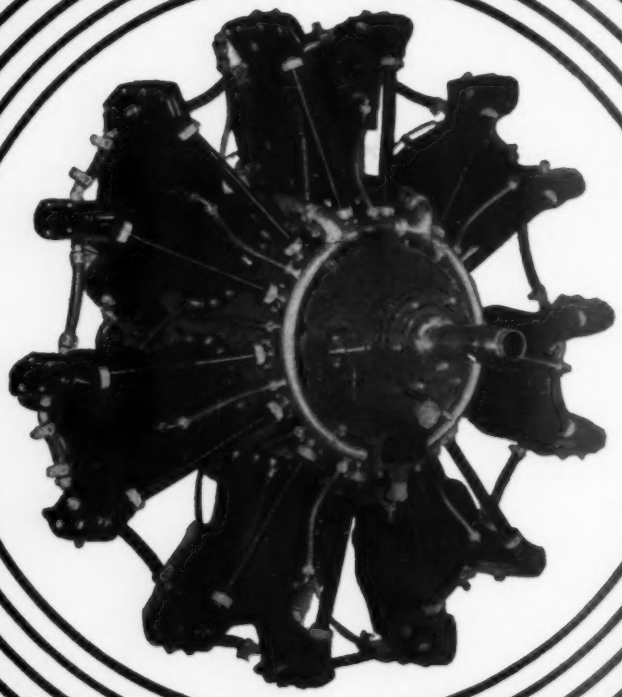
THE GOVERNMENT'S short-term free aircraft courses in the public schools are doing a good job—despite their lack of experience—in turning out temporary or single-phase workers. BUT, the aircraft industry is faced with a grave responsibility in producing the long-range bombers and swift pursuit ships to defend our shores and the huge transports for the era of aviation expansion that will follow the present emergency. America's future depends on the long-range training of the men who will design and build these ships. Two things govern the value of each man: His serious purpose in selecting aviation as his life's work; and THE ABILITY AND EXPERIENCE OF THOSE WHO TRAIN HIM FOR THAT CAREER. Curtiss-Wright Technical Institute, under the personal supervision of Major C. C. Moseley, President and sole owner since its inception, is America's most distinguished school specializing in the training of Aeronautical Engineers and Master Aviation Mechanics, its standing in the industry is attested by its selection by Donald Douglas, President of the Douglas Aircraft Co., as the school for his own son's training. Its accumulated experience of many years in technical aeronautical instruction supplies the aviation industry with graduates thoroughly qualified as supervisory personnel and is now being utilized in the National Defense Program by the U. S. Army Air Corps in the training of hundreds of enlisted men as Air Corps Mechanics, while its flying affiliates, Cal-Aero Flight Academy, Mira Loma Flight Academy and Polaris Flight Academy, are extending primary and basic training to Flying Cadets of the U. S. Army and the Royal Air Force. With a proved and tested curriculum and unsurpassed faculty of practical engineers and technicians, we feel profound satisfaction in filling the industry's call for men "trained to precise order" . . . the career men on whom aviation's future depends. Curtiss-Wright Technical Institute is now training approximately 2,000 students, of whom approximately 500 are U. S. Army Air Corps enlisted men, and is prepared to expand to accommodate 5,000 students if necessary in the interests of National Defense.

CURTISS WRIGHT TECHNICAL INSTITUTE

GRAND CENTRAL AIR TERMINAL
GLENDALE (LOS ANGELES) CALIF.

CONTRACTORS TO THE
U. S. Army Air Corps

JACOBS



ENGINES

JACOBS AIRCRAFT ENGINE CO.

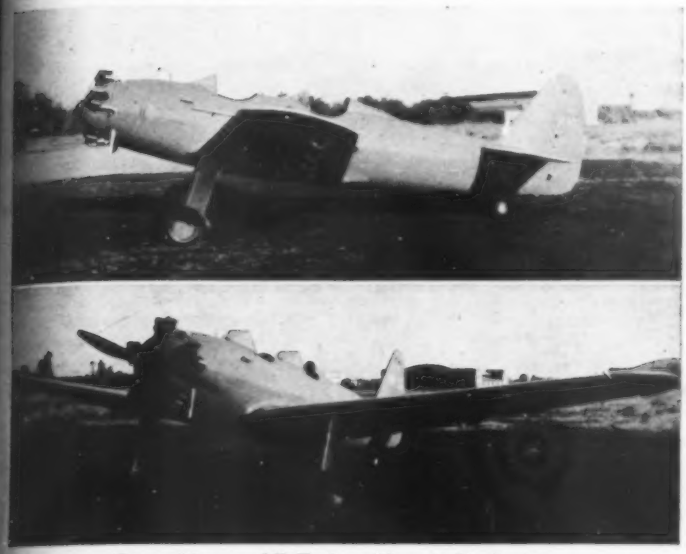
POTTSTOWN • PENNSYLVANIA • U. S. A. • CABLES: JAECO

Aircraft Adopts Plywood

(Continued from page 19)

have shown it to be as fireproof as aluminum alloy.

Company officials stress the fact that plastic-plywood fuselages can be purchased readily today, a factor making for faster production than is now possible on lightplanes of aluminum alloy.



Timm 'Aeromold' Trainer Now in Production

Increased 'Aeromold' Schedules Predicted

OFFICIALS of Timm Aircraft Corp., Van Nuys, Cal., predict the necessity for faster schedules in building the Timm "Aeromold" plastic-plywood trainer, several of which are now under construction for the Navy and schools with CPT courses.

Additional contracts recently signed with leading Pacific coast aircraft manufacturers have raised the company's backlog to $1,400,000, the largest in the firm's history. It is understood the contracts call for aircraft parts fabricated by the Timm "Aeromold" plastic-plywood process as well as metal units, all of which are intended for fighter planes.

Purchase of 54 acres of land immediately adjacent to Los Angeles Municipal Airport at Van Nuys marks the initial step in an expansion program to permit development of a permanent, modern plant for manufacture of parts and the plastic-plywood trainer. Included in the plan is a private landing field for test flights.

• • •

Fletcher Draws Labor from Furniture Industry

Fletcher Aviation Corp., Burbank, Cal., now engaged in the production of a plywood trainer, draws labor and machinery from the furniture industry, rather than from "the much needed skills and machine tools required to make all-metal planes."

The trainer is said to be designed so that each part—wings, rudder, stabilizers, flaps—fits either right or left side of the ship. "A time saving exclusive process known as 'Plyweld' makes construction methods equally unusual," company states.

Pictures and details of the Fletcher FBT-2 were released in AMERICAN AVIATION Feb. 1, 1941, p. 42.

• • •

Doak Aircraft Co. Tests New Plywood Trainer

The low-wing, plywood trainer built by Doak Aircraft Co., Hermosa Beach, Cal., has been undergoing static tests, having been tested for strength of construction with loads of 19,000 pounds of sand on the wings.

Briggs Plane Backlog Rises to 65 Millions

Briggs Manufacturing Co., first automobile firm to claim volume production on aircraft parts, last month announced receipt of a $23,000,000 contract for gun turrets, bringing its total plane backlog to $65,000,000.

The new business does not include the work to be done in a recently-authorized $8,800,000, 450,000 sq. ft. plant, which, according to company officials, "is being prepared for much larger turret orders." It is believed that such orders, when announced, will carry Briggs' aircraft backlog over the $100,000,000 mark.

In conjunction with Sperry Gyroscope Co., Briggs has for more than a year engaged in engineering, developmental and experimental manufacturing activity on airplane gun turrets. First units were delivered in April.

The Business Route of the Nation

IS SAVING TIME—*Now!*

More passengers, more mail, more express are flying United Air Lines short, central Main Line Airway than ever before.

For United's Mainliners fly *the business route of the nation*, linking the industrial East, the production centers of the Great Lakes region, and *every* major Pacific Coast city.

Government business, defense business, private business—all are saving time over the Main Line Airway, which today marks the life-line of our national preparedness and security.

UNITED UNITED AIR LINES **Air Lines**

9 Instrument Landing Systems in by Spring, CAA Says, as Immediate Action Is Urged

By ERIC BRAMLEY

FOLLOWING accusations that neither the airlines nor the Civil Aeronautics Administration has diligently pursued development of an adequate instrument landing system, the CAA has told AMERICAN AVIATION that between now and next March, nine ultra-high frequency systems will be installed in different parts of the U. S.

In addition, CAA has advertised for bids on seven more, so that there will ultimately be 16 in operation.

"We, in this country, should be ashamed of the record on the development of this particular type of flight aid," said A. E. Blomquist, airport engineer for Eastern Air Lines, in a recent Chicago speech.

Addressing the fall airport conference of the Illinois Institute of Technology, Blomquist said, "It is easily evident that the airlines . . . have . . . been seriously retarded in developing a dependable service. It is also apparent that the cause of the instrument landing system has not been as diligently pursued by the airlines, acting individually or in concert as should rightfully be expected. The actions of the Civil Aeronautics Administration and its predecessors appear to have been entirely ineffectual in performing a task that the enabling act charges them with."

Admit Difficulty

Told of Blomquist's remarks, CAA officials tacitly admitted that development of an adequate system has been a tough row to hoe, were glad Blomquist included the airlines in his criticism. As it now stands, CAA's nine systems will be ready by the time the airlines get necessary equipment installed in their airplanes. This equipment is on order.

Informed that a press release had been issued by CAA on Jan. 22, 1940, announcing that "approximately 10" systems were to be purchased, a CAA official explained in detail the difficulties which have been encountered since that date.

Because of pleas from manufacturers, an unusually long time was allowed to elapse between advertisements for bids and the actual opening of bids, he said. Then when bids were finally received, it was discovered that each system would cost almost twice as much as CAA had anticipated. This led to a shuffling of funds and a reduction in the number, and only recently, by removing equipment from Indianapolis, has CAA been able to raise the total to nine.

Even after selecting a system, the CAA official hinted that CAA was hampered by insistence of other interested parties that they had better systems. Also, he said, the Army, while not in opposition, was "magnificently disinterested." Army officials said they preferred another system, have only recently admitted that maybe CAA is on the right track, he added.

Last in by March

National defense requirements have interfered to some extent with manufacture of the equipment, but the first system is about ready for installation, and the last is expected to be in by March.

The nine systems will be located at LaGuardia Field, Cleveland, Washington National, Chicago, Kansas City, Los Angeles, Atlanta, Indianapolis and probably Oakland. The systems are somewhat similar to the original one developed by CAA at its Indianapolis experimental station, and called the "Indianapolis system." International Telephone & Development Co. was the manufacturer.

In his Chicago speech, Blomquist said: "The airlines of the United States have, since 1936, given away at least $11,000,000. That figure is not money they might have received but is cold, hard cash in hand that was handed back to canceled passengers.

"It seems like a sizeable sum to throw in the street but it represents, certainly, not more than 20% of the indirect costs of the hundreds of canceled flights and must be small indeed when compared with the millions lost by 'stacking,' holding at way stations for a few hours and overnight, and other forms of traffic delays . . . The cancellations, caused in the main part by conditions of ceiling and visibility below the minimums set by the Civil Aeronautics Authority, have caused Eastern Air Lines to cancel 1,299,834 miles of scheduled operation in 1939 and 1940 and to return to canceled passengers approximately $720,369 in that two-year period."

Immediate Installation

Blomquist said that "the answer to the existing conditions is the *immediate* installation of some reasonable instrument landing system at most airline airports and the gradual reduction of . . . ceiling and visibility minimums as flight crews become proficient in the use of the system and the system itself is brought toward perfection."

It seems advisable, he said, not only to make further studies throughout the industry, but also to apply immediate and concerted pressure through the medium of the Air Transport Association to speed the installation of some type of instrument landing system.

As early as 1932, he claimed, several systems were proposed and demonstrated, and "since that time there have been a half a dozen systems, any one of which might have been developed to a reasonable point of operating stability.

"In 1935 and 1936 United Air Lines made well over 1,000 landings at the Oakland . . . airport by using the Bendix landing system. All of these landings were under the hood. Numerous tests and landings were run at Newark . . . on this system in 1937 and 1938. There were over 100 landings made while under the hood. The A. T. & T.-Lorenze system was tested over a long period of time at Indianapolis.

"The Air Track system was tested at Pittsburgh by Pennsylvania-Central Airlines. The Army or Hegenberger system was developed in 1936 and has been tested and used by the Army innumerable times since that date.

"Perhaps the most accusing evidence is the use of the Lorenz system at Europe's leading airports. This system was put in service in 1934 and used from that date on."

Remember—The Camera Never Lies

ONE OF PRESS AGENTRY'S most determined photographic efforts of the fortnight (above), via Carl Byoir and Associates, shows Stephens College student Doris Clark of Asheville, N. C., applying the "feminine" touch to an airplane engine, with Maj. Alton Parker, TWA Stratoliner pilot, working up professional amusement during a "laboratory experiment." In a few words: the Columbia, Mo., girls' school this fall offers "Aviation I," a course in commercial air transport operations, "first of its kind ever offered in an American girls' college." Maj. Parker is one of the lecturers for the course. Four airlines—TWA, Mid-Continent, Braniff and Chicago & Southern—provide guest instructors, according to the announcement.

EAL Awarded Stop at Atlantic City

THE CIVIL Aeronautics Board on Nov. 3 amended the certificate of Eastern Air Lines to include a stop at Atlantic City, N. J.

At the same time, the Board denied applications of TWA and Pennsylvania-Central for permission to serve the New Jersey resort. A CAB examiner's report had recommended that both EAL and TWA be granted stops.

"To provide direct service from Baltimore and Washington to Atlantic City, and also through service from points west of Philadelphia, would require the granting of certificates both to Eastern and to TWA," the decision said. "That in turn would require either the establishment of a shuttle service between Philadelphia and Atlantic City by TWA, or the establishment of a shuttle . . . between Washington and Baltimore and Atlantic City by Eastern, or the duplication of services in competition between the two carriers between New York and Atlantic City.

"Of the alternatives thus presented, it seems to us that the least unsatisfactory is that of allowing Eastern to serve all the points involved, even with the resultant requirement that passengers from Reading, Harrisburg, Pittsburgh and other western points should change airplanes at Philadelphia."

The stop will not be included in EAL's routes until national defense requirements no longer necessitate deferment.

LA Mayor Wants Service

Mayor Bowron of Los Angeles stated recently that he does not believe the Pacific Coast has had "a square deal" in the matter of air transportation connections with Latin America. "I don't think we should sit idly by and not voice our protests," he said, adding that certain "interests and authorities" are making it difficult to keep up with other parts of the country.

CAB recently denied Pan American Airways permission to operate between Los Angeles and Mexico City. Cia Mexicana de Aviacion, PAA's Mexican subsidiary, now operates the route three times weekly, and the Board stated that if additional service is needed, that company can furnish it.

XUM

MAKING AVIATION HISTORY

There's a quick beat in all our hearts for the members of the U. S. Army Air Corps. Their wings speed them in their watch over American skies in miracle time—the nation's modern Minute Men. Among the Air Corps' most advanced aircraft is our Bell Airacobra—the world's only single engine fighter carrying an armor-piercing cannon. Bell Aircraft has grown to 10,000 loyal employees in meeting the urgent need for Airacobras. Masterfully trained in the important tasks of volume aircraft production, each Bell worker now joins in a faithful pledge that the U. S. Army Air Corps shall be proud of the job that's being done in producing Bell Airacobras.

Bell Aircraft

Producers of
THE BELL AIRACOBRA
"Cannon on Wings"

© Bell Aircraft Corporation, Buffalo and Niagara Falls, N. Y.

Brookings Study Warns . . .

CAB Must Take Broad View or Risk Future

IN SETTING air mail rates, the Civil Aeronautics Board should consider the welfare of the entire transportation industry, or run the risk of being "abolished or merged in some new agency which will have all forms of transportation under its jurisdiction."

Because of rising airline profits, CAB may be forced to cut passenger fares in order to control the economic status of the carriers.

These two sweeping conclusions are reached by Dr. F. A. Spencer in his book *Air Mail Payment and the Government*, released Nov. 3 by the Institute of Economics of The Brookings Institution.

Author-Pilot Spencer claims that in the near future the Board may be faced with the necessity of determining what constitutes the "minimum constitutional rate" for the carriage of mail by air.

Spencer

Charging that to date CAB has not "moved rapidly in exploring the enlarged field of rate determination made available to them under the new act," Dr. Spencer states that if airline patronage and profits continue, CAB will soon be faced with the problem of deciding whether mail, passenger and express rates shall be reduced in order to check unreasonable profits.

Air Fare Cut Probable

It is apparent, he writes, that unless airline costs go up rapidly because of current war conditions, it may be necessary for the Board to initiate passenger rate proceedings to control the economic status of the carriers.

CAB has the power to regulate passenger rates, but so far has merely been "smoothing out . . . some of the rough spots in the rate structure," according to the book. Recent increases in passenger revenues, plus lower costs of operation, have so increased the profits of some of the larger companies that even if mail pay were reduced to a weight basis equivalent to passenger rates, excessive profits might result. The book points out that in 1940 a mail rate of .3 of a mill per pound-mile would have provided Eastern Air Lines with an "unreasonable profit," according to CAB standards, on some routes, and that at zero mail pay some routes would have been profitable.

"To avoid meeting this problem face to face, the . . . Board will doubtless depart from fixing rates by routes in favor of a system rate," the study adds.

Constitutional Minimum

Explaining a "constitutional minimum rate," Dr. Spencer states: "To put it differently, if a carrier could actually carry the mail for nothing (and it appears that Eastern could do this on certain routes) and still earn a profit on its total operations over the route in question, what mail payment must be made to be compensatory for the service rendered?" He indicated that this question may have to be answered in the Eastern rate case, now pending.

After stating that CAB must decide if mail-passenger-express rates shall be reduced to check unreasonable profits, the writer comments: "It may be true that the elasticity of demand for air transportation and the cost curve of at least some of the carriers may be such that a decrease in passenger and express rates might so expand their business as actually to increase net revenues rather than decrease them.

"In that event, the CAB would have to face the question of what sort of competitive situation the lowering of plane fares would bring about with reference to other passenger and express carriers and whether the transfer of business from the ground to air carriers under these circumstances would be in the public interest. They would have also an alternative of applying the increased revenues of the carriers to the maintenance of that portion of terminal and other flying facilities which are now provided at public expense . . . When the war is over . . . there will be tremendous pressure to expand the air transport as a means of cushioning the effect of post-war adjustment.

"It is wise for the Board now to ponder its responsibility to view air transport as an integral unit of the whole transportation system rather than a completely independent method to be fostered regardless of the effect on other means of transport.

Could Cripple Other Media

"The Board has a potent power in the mail rate. It can, by prescribing a high mail rate, provide the air mail carriers with sufficient revenues to enable them to charge passenger and express rates low enough to cripple seriously other transportation media.

"No form of transportation should be protected as a vested interest against legitimate competition from new agencies. But unless careful attention is given to the relationships between various competing forms of transportation, regulation in the hands of separate bodies may work at cross-purposes, to the disadvantage of the public. If this conflict becomes marked, it is likely that the . . . Board as economic regulator and promoter of air transportation may be abolished or merged in some new agency which will have all forms of transportation under its jurisdiction."

The book states that CAB has "moved very slowly indeed with respect to accounting control."

Public counsel—attorneys employed by CAB to represent the "public"—might "well be eliminated" if CAB in the future "should come to rely on economists, accountants and statisticians in determining the contents of its decisions . . . The idea that the public counsel has a necessary role to perform as representing the general public interest is negatived by the fact that this responsibility devolves upon the Board itself," Dr. Spencer charges.

SUMMARY OF PAN AMERICAN AIRWAYS OPERATIONS FOR JUNE

(Compiled by AMERICAN AVIATION from Reports to CAB a)

	Rev. Pass.	Rev. Pass. Miles	Seat Miles Operated	Pass. Load Factor	Ton-Miles U.S.Mail	Pass. Revenue	U. S. Mail Revenue	Foreign Mail Revenue	Exp. & Frt. Revenue	Operating Revenue	Operating Expense	Net Revenue From Operation
Pan Am. Airways Inc., Alaska Division, Juneau-Fairbanks	368	247,998	403,557	61.4%	3,062	$ 29,913	$ 5,885	$ 00	$ 1,017	$ 37,270	$ 71,670	$ 34,400 (nd)
Pan Am. Airways Inc., Alaska Division, Seattle-Juneau	238	238,144	265,017	89.7%	8,268	21,021	00	00	1,778	23,096	51,436	28,340 (nd)
Pan Am. Co., New York-Bermuda b	112	153,664	220,792	74.1%	00	13,600	2,358	00	210	27,913	41,475	13,562 (nd)
Pan Am. Airways Co., New York-Lisbon	711	1,577,653	2,788,754	57.0%	50,718	183,019	198,312	263,610	262	634,646	537,230	97,416
Pan Am. Airways Co., San Francisco-Auckland	91	444,417	585,862	75.8%	10 637	34,960	00	28,660	7,128	72,379	179,343	106,963 (nd)
Pan Am. Airways Co., San Francisco-Hong Kong	288	1,292,867	1,824,362	84.8%	48,918	124,139	248,079	100,686	18,840	499,222	374,709	124,513
Pan Am. Airways Inc., Eastern Division	7,447	4,639,212	6,468,303	71.7%	....d	413,064	409,928	22,178	40,574	932,949	784,633	148,316
Pan Am. Airways Inc., Western Division	4,798	3,470,615	4,918,857	84.7%	....d	214,376	163,343	15,713	19,803	430,399	397,990	32,409
Pan American-Grace Airways Inc.	3,295	1,714,016	2,788,267	61.5%	12,717	141,794	216,398	25,690	17,081	428,493	352,510	75,983
Pan Am. Airways Inc., Panama division c	....	....	....	....	....	....	....	....	....	....	....	....
Braba, Medellin & Central Airways Inc.	264	63,960	185,976	34.4%	00	6,508	00	00	4,178	10,993	13,003	2,010 (nd)

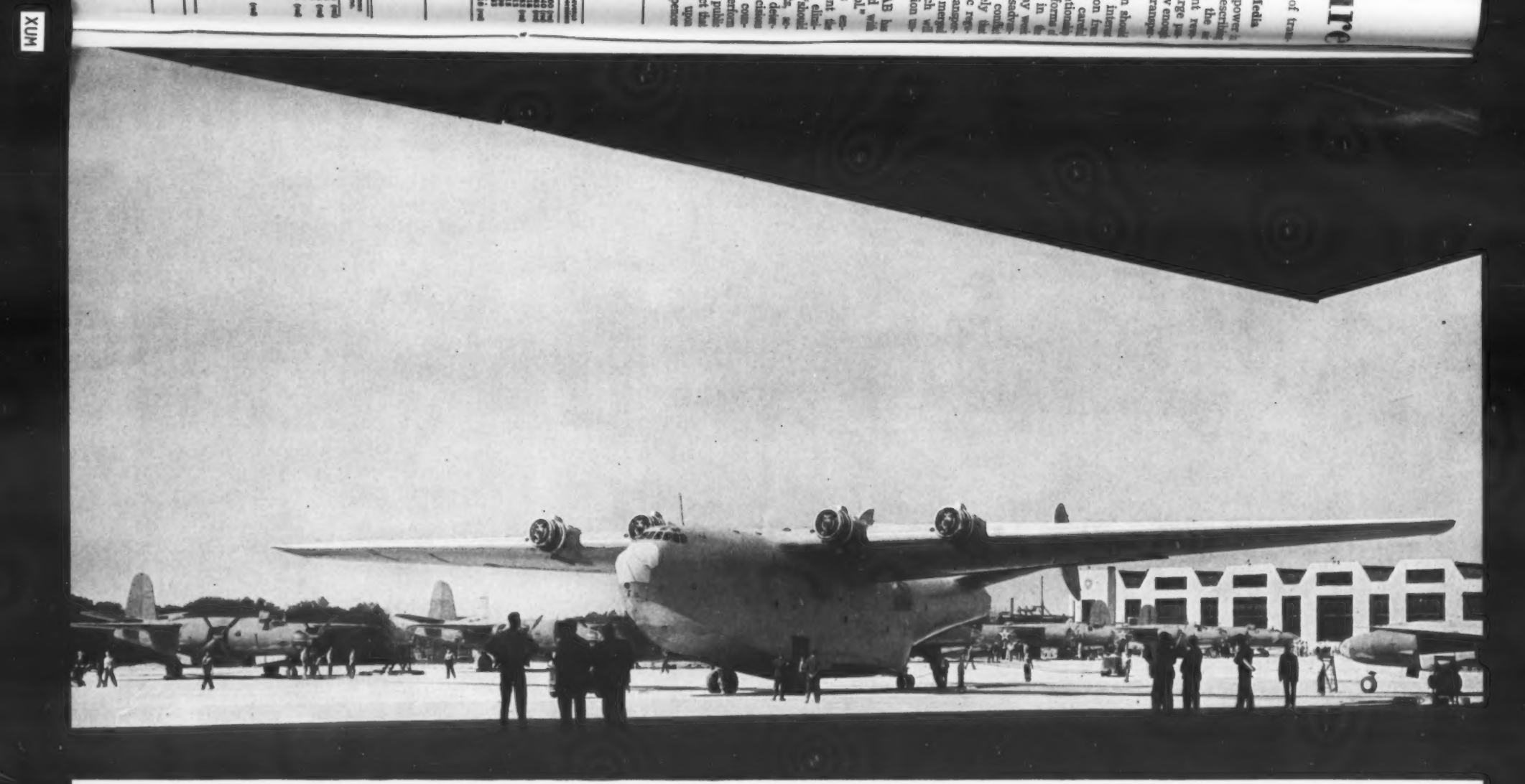
a All monthly reports to CAB are subject to revision and year-end adjustment.
b CAB has permitted carrier to suspend local service indefinitely. Traffic between New York and Bermuda will be handled by trans-Atlantic Clippers.
c Report for June has not yet been received by CAB.
d Not reported by company.

SUMMARY OF U. S. AIR TRANSPORT OPERATIONS FOR AUGUST

(Compiled by AMERICAN AVIATION from Reports to CAB a)

	Rev. Pass.	Rev. Plane Miles	Rev. Pass. Miles	Avail. Seat Miles	Pass Load Factor	Planes Operated	Exp. & Frt. Lb.-Miles	Mail Lb.-Miles	Pass. Revenue	Mail Revenue	Exp. & Frt. Revenue	Operating Revenue	Operating Expense	Net Income Before Inc. Taxes
All American	00	70,259	00	00	00%	2	$14,647	1,923,989	$ 00	$ 00b	$ 240	$ 240	$ 29,222	$ 29,793 (nd)
American	128,408	2,987,435	41,856,458	55,133,878	75.56%	91	240,461,886	497,494,689	2,119,948	388,400	64,699	2,909,932	1,915,019	684,965
Braniff	15,540	495,551	4,634,989	9,013,554	51.42%	16	18,799,312	61,112,250	212,923	98,689	6,015	310,972	324,827	5,548 (nd)
Canadian Colonial	5,801	94,438	1,409,909	1,958,775	72.00%	5c	1,515,288	2,340,083	77,746	22,665	331	108,146	66,048	21,992
Catalina	8,820	22,200	174,600	218,280	79.99%	2	402,690	00	29,100	00	188	29,388	17,093	12,319
Chicago & Southern	9,760	224,402	2,439,671	4,584,395	53.23%	6	9,550,520	29,774,520	111,003	35,116	2,940	149,058	152,342	2,529 (nd)
Continental	2,721	159,463	752,484	1,916,166	39.27%	6	865,037	8,163,046	32,358	84,885	223	87,743	87,870	256
Delta	8,861	338,469	2,317,157	4,500,948	48.26%	8	4,613,238	26,114,946	102,404	37,199	1,184	164,413	150,324	13,534
Eastern	49,439	1,874,398	17,483,248	32,972,444	52.96%	36	100,058,168	268,019,392	909,815	185,167	28,785	1,319,393	982,392	157,951
Inland	1,799	134,878	483,174	1,348,790	35.82%	5	994,850	4,752,523	20,734	44,400	195	65,814	56,784	9,033
Inter-Island	5,337	83,106	692,517	877,648	78.91%	6	2,276,964	450,322	85,104	3,916	1,039	71,582	48,836	22,782
Mid-Continent	4,103	199,643	1,061,217	2,269,158	46.80%	8	2,213,690	15,108,185	47,366	69,400	813	117,907	116,337	2,034 (nd)
National	2,374	115,483	630,711	1,512,304	41.44%	5	1,408,828	8,850,616	30,534	32,328	381	63,422	50,878	12,179
Northeast	6,841	128,537	1,037,688	2,124,910	48.43%	7	1,280,785	2,005,750	57,907	29,985	430	88,673	81,585	4,039
Northwest	19,609	892,710	7,738,900	11,560,843	66.91%	16	41,676,823	176,818,130	327,360	174,062	11,980	522,931	406,125	117,023
Penn-Central	42,037	677,179	8,008,884	13,332,192	60.05%	23	29,251,211	35,180,552	442,066	70,708	10,004	525,961	440,309	81,832
TWA	46,911	1,838,393	22,547,134	33,753,287	66.80%	43d	179,264,741	473,149,581	1,148,318	278,800	44,684	1,491,074	1,282,782	207,222
United	67,544	2,387,498	32,858,742	42,823,482	76.73%	68	289,256,556	635,993,525	1,626,920	358,596	78,496	2,065,892	1,547,257	526,614
Western Air	9,026	310,839	3,020,700	4,927,285	61.31%	10	28,942,684	44,289,917	141,494	71,761	6,273	223,932	179,623	44,406
TOTALS	430,426	12,714,935	148,916,820	225,128,126	66.15%	360	953,316,875	2,291,542,046	$7,512,097	$1,916,064	$259,719	$9,830,081	$7,984,947	$1,686,261

a All monthly reports to CAB are subject to revision and year-end adjustment.
b Mail rate had not been established by CAB.
c Includes two rented planes.
d Includes one rented plane.



PREVIEW OF TOMORROW!

THROUGH THE WORLD'S LARGEST DOOR

A TRIBUTE to Martin engineers and workmen was the Navy's order to create the world's largest flying boat. The mighty XPB2M-1 introduces a new era in over-ocean flying. Your Navy, in foreseeing the need for such a plane, displayed the vision which has made American ships . . . both of the sea and of the air . . . second to none. In the XPB2M-1 the Martin Company has done more than give America a great new weapon . . . It has given the world a preview of the even greater flying boats yet to come . . . The Glenn L. Martin Company, Baltimore, Maryland, U. S. A.

Martin
AIRCRAFT

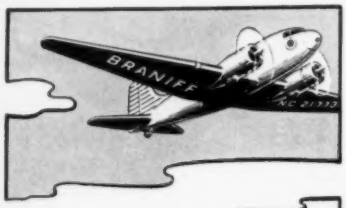
Builders of Dependable Aircraft Since 1909

TRADE MARK

Airline Personnel

Sweeney to Navy

Edward C. Sweeney, attorney for CAB, has gone on active duty as first lieutenant in Naval Air Intelligence. Sweeney, who recently prepared the comprehensive study on aviation liability insurance, recommending legislation, has been granted indefinite leave of absence from CAB.



MAKE EVERY MINUTE COUNT... SOUTHWEST

Cooperating with the national effort, Braniff provides fast, convenient, time-saving schedules, serving Chicago, Kansas City, Wichita and the major cities of Oklahoma and Texas.

Braniff gets you there ahead of time . . . refreshed, ready for the work ahead.

BRANIFF Airways

SOUTHWESTERN HOSPITALITY ON WINGS

OPERATED IN THE INTERESTS OF COMMERCE, THE POSTAL SERVICE AND NATIONAL DEFENSE

IN THE Sales & Traffic OFFICE

Fred Stephens, Art LaFrance, Jack Finn and **Pat Boyne** have been added to United's passenger service staff at New York.

Elwood Alexander has been transferred from New York to Washington by Pan American. He is working in the sales department.

Miss Loula Southgate has been named director of the southern division of Pennsylvania-Central's women's department.

W. R. "Ike" Lynn, left, who has been district sales manager for Mid-Continent in Des Moines, has been promoted to head of the company's air mail, express and passenger service division at Kansas City. **Howard E. Davidson,** right, formerly sales representative in the Twin Cities area, has succeeded Lynn at Des Moines.

J. E. Harper is National's new station manager at Pensacola. He has been with the company at New Orleans, Jacksonville and Tampa.

Merle J. Oelke, for several years chief staff photographer for American, has been named publicity director of the company's southeastern division, with headquarters in Washington.

New Pennsylvania-Central reservations clerks include **Evelyn Hunt** and **Ruth Orr** at Pittsburgh, **Mary Cavanaugh** at Detroit, and **P. W. Akin, H. J. Myers** and **W. D. Ord** at Washington.

Kenneth T. Ripley, left, has been named Chicago district agency sales manager for Braniff Airways, while **Robert T. Phinney, Jr.,** right, has been promoted to the post of Oklahoma City district traffic manager.

Hartman DeMers and **Lee Johnson** have been assigned to the traffic department of Pan American's Alaskan division. **Gilson C. Hobbs** is now with PAA's district sales in New York.

Jack Barnett has been added to United's Chicago reservations staff, and **A. A. Zeigler** has joined the company's traffic department in Washington.

Terminal Officers Named

Charles A. Miller, assistant general traffic manager of Pan American Airways has been elected president of Airlines Terminal Inc., succeeding John B. Walker, assistant to the president of United Air Lines. Other officers elected were C. R. Speers, of American Airlines, vice-president, and W. S. Allen, manager of the Airlines Terminal Building, secretary and treasurer. Directors elected to serve for one year were Walker; Prescott Tolman, Eastern Air Lines; W. F. McGrath, TWA; Speers and Miller.

Court Rejects Robbins' Plea

The Circuit Court of Appeals for the Second Circuit has refused to stay a CAB order suspending the commercial pilot certificate of Hugh C. Robbins for a period of 60 days. Robbins, who flew a New York *Daily News* photographer over the British battleship "Malaya" last Apr. 6, during which time CAB said he violated the Civil Air Regulations, had asked the Court for both a stay and a review. In view of the refusal to stay CAB officials said they expected the request for review to be withdrawn.

AIRLINE Operation and Maintenance

Granville M. Greene has been promoted by American to the post of assistant superintendent of fleet service, and **Redmond J. Lyons** has been named assistant to the supervisor of fleet service.

Cecil "Jimmy" Register, assistant chief flight steward of Eastern, recently was honored upon completion of his 6,000th hour and 1,000,000th mile in the air.

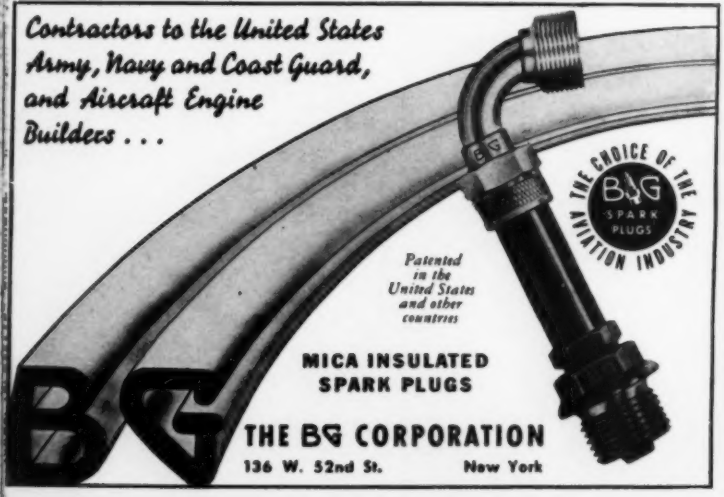
New mechanics employed by Pennsylvania-Central include **Arthur M. Myers, W. R. Oprendek** and **Alex Pratchenko** at Pittsburgh; **Robert DeBell** at Washington, and **William Hollis** at Norfolk.

Honored by Chicago & Southern recently were 11 "million-mile" flight captains: **L. D. Anderson, Stuart W. Hopkins, Ben S. Catlin, Charles Quinn, C. M. Sterling, M. T. Benedict, W. J. Fry, D. K. Franklin, Earl C. Rockwood, V. L. Hogan-son** and **H. D. Gossett.**

The following United employes with reserve commissions have been called to active duty: **Lloyd S. Beggs,** first officer at Seattle, to Navy; **John F. Turner,** Boeing School instructor, to Army; **Alvin G. Orr,** first officer at Chicago, to Navy, and **John E. Keyes,** dispatch clerk at Oakland, to Army.

Pan American has assigned the following as junior pilots on the Pacific division: **Donald E. Loomis, Guy Franklin McCafferty, F. V. Koepke, W. W. Hester, R. D. Postlewaite, C. J. Howe, C. D. Renshaw, A. L. Terwilleger, E. G. Kelley, R. D. Steers** and **J. G. Henriksen.**

Contractors to the United States Army, Navy and Coast Guard, and Aircraft Engine Builders . . .



MICA INSULATED SPARK PLUGS

THE BG CORPORATION

136 W. 52nd St. New York

WORLD'S PREMIER AIRPLANE FABRIC

LIGHTER STRONGER SMOOTHER

FLIGHTEX

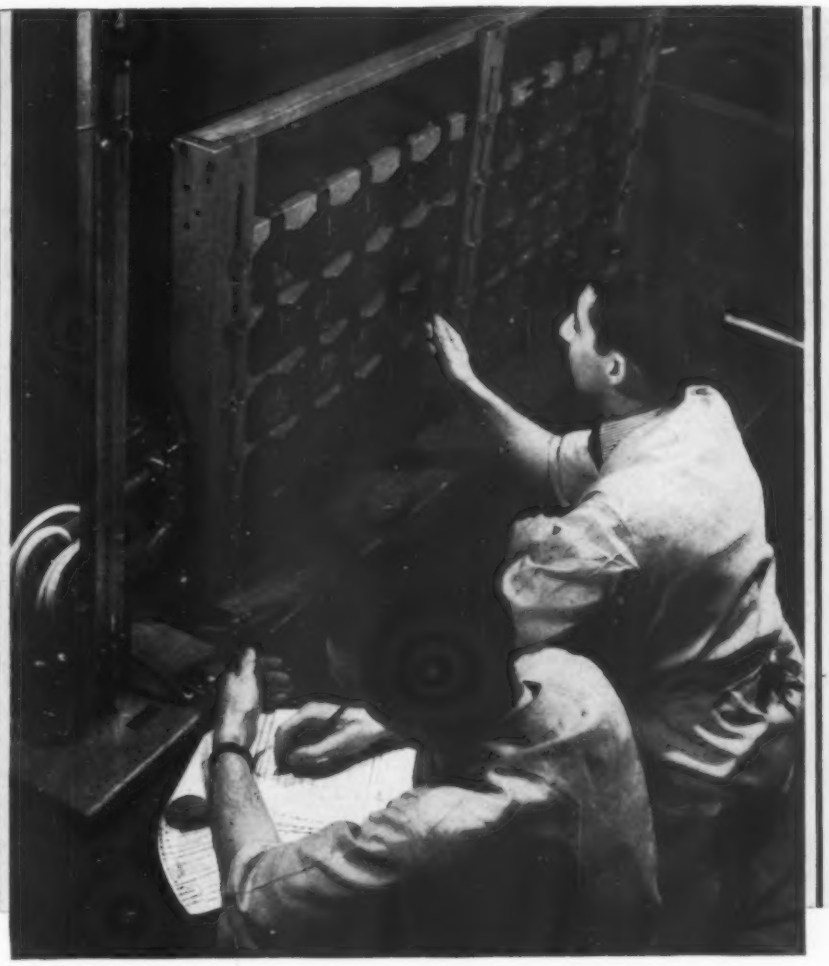
SUNCOOK MILLS - 40 WORTH ST. - NEW YORK, N. Y.

Leading Manufacturers of Fabric and Tapes for the Aircraft Industry.

FLIGHTEX FABRIC

Export Representative—Aviation Equipment & Export, Inc., 25 Beaver St., N. Y.

Cable Address — Avequip



Precautions here become *protections* aloft

☆☆☆ Accuracy aloft under all flying conditions is born here, where traditional Pioneer craftsmanship and precision are supplemented with test after test on highly specialized inspection equipment. Thus the truthfulness of what the pilot sees recorded on Pioneer Instruments is safeguarded to a degree that makes the possibility of appreciable error most remote.

Pioneer INSTRUMENT

DIVISION OF BENDIX AVIATION CORPORATION • BENDIX, NEW JERSEY

LET'S GO! U.S.A. · KEEP 'EM FLYING!

Two Accidents Mar 8-Month Safety Record of Airlines

AS THE END of October drew near, U. S. domestic airlines had completed eight months of operations without a fatality, had safely carried 3,065,000 passengers more than one billion passenger-miles. The Congressional committee headed by Representative Jack Nichols (D. Okla.) had completed its domestic crash investigations, and three members were in South America to study the airline picture. Jerome Lederer, CAB safety bureau chief, was completing a tour of all airline operations bases to see what was being done in preparation for winter flying.

Then, on Oct. 30, within a 24-hour period, two crashes took 34 lives, spared one pilot. The Nichols committee scurried back from South America, Lederer interrupted his tour and his investigators rushed to the wrecks, as did CAB Vice Chairman Edward P. Warner and CAA Administrator Donald Connolly.

The first crash came in early morning when a Northwest Airlines' DC-3 fell and burned at Moorehead, Minn., while preparing for a landing at nearby Fargo, N. D. Twelve passengers and two crew members were killed, but Captain Clarence Bates, thrown clear, lived to tell a story which may prevent future mishaps.

Second Crash in Evening

The second crash, occurred in late evening of the same day when an American Airlines' DC-3 (the company had flown over one billion passenger-miles without fatality) fell and burned near St. Thomas, Ont., killing 17 passengers and three crew members.

Said NWA Captain Bates in a deposition for CAB investigators: ". . . the airplane started to flutter or shake and the controls worked hard . . . I had no sensation of a stall." Ice had been building up on the plane, but "there wasn't one-quarter or one-tenth the amount . . . I had experienced on other trips."

There was no one to tell the story of the American crash. Some witnesses claimed the motors of the New York-Chicago ship were sputtering and that the plane was circling as if the pilot was attempting to make an emergency landing.

Degree to which persons engaged in national defense activities are using the airlines was seen from the passenger lists. Among those aboard the American plane were Edward Bigda and A. L. Lewis, employes of Vought-Sikorsky Division of United Aircraft Corp.; E. R. Root, industrial relations manager of Stinson Aircraft; George E. Russell, of Gilman Fanfold Corp.; E. A. Benz, engineer for the Fram Co.; V. R. Conzett, Revere Brass Co.; T. A. Frazer, Detroit Copper and Brass Co.; G. S. Van Norman, American Brass Co.; and E. J. Watt and Joseph Bacon, of Chevrolet. Crew members were Capt. David I. Cooper, Co-pilot Richard L. Owens, and Stewardess Mary E. Blackley.

Headlines in Papers

Among those flying NWA were F. R. Lowell, sales manager of the engine division of National Supply Co., and R. W. Ramsey, president of Ramsey Lumber Co. Crew members killed were Co-pilot Alden Onsgard and Stewardess Bernice Blowers.

Newspapers throughout the country played the crashes in glaring front page headlines, convinced that air accidents are still bigger news than other transportation tragedies, such as the Oct. 26 bus smashup at Clinton, Ala., killing 22, the bus crash the same day near Joplin, Mo., injuring 36, or the train wreck at Dunkirk, O., on Nov. 9, killing 12 and injuring many more.

• • •

Nichols Committee Reports EAL Crashes

THE Select Housing Committee to Investigate Air Accidents, headed by Rep. Jack Nichols (D. Okla.), during the past fortnight submitted reports on the probable causes of the Eastern Air Lines' accident at Atlanta, Ga., on Feb. 26, and Vero Beach, Fla., on Apr. 3.

Concerning the Atlanta crash, which killed eight and injured eight, the committee expressed its belief that "had Eastern . . . required a check-off between the pilot and co-pilot of both altimeters after the Kollsman was set, the accident would not have happened, and could not have occurred if the erroneous Kollsman setting was in fact the cause of the crash."

The Vero Beach accident (no fatalities) was caused by "a storm of tornadic intensity, a combination of other facts and circumstances such as inadequate weather data and the change of personnel at a criticial time in the weather," and "the contribution of many human errors."

Atlanta Report

In its Atlanta report, the committee said: "Whereas regional managers and inspectors of the Civil Aeronautics Administration are better informed as to prevailing conditions at airports, the qualifications of flight and ground personnel, the kind and condition of equipment, the peculiarities of terrain and weather in their areas, than officials located elsewhere, the Committee believes that the Administrator, in the interest of safety, should give authority, subject to review, to inspectors and regional managers authorizing them to make such temporary decisions and regulations, including the establishment and modification of minimums of ceiling and visibility in their areas, as emergency conditions may in their judgment require."

Among "human errors" in the Vero Beach crash were: "the inaccurate description of the storm by the Vero Beach communications operator and observer; the failure of others to grasp the significance of the data contained in his reports: the failure of the company to advise Capt. O'Brien of the Vero Beach weather reports; the failure of Capt. O'Brien to listen to the range frequency over which regular and special weather reports were broadcast; the failure of Capt. Myers, after escaping from the storm, to make every effort to inform other flights of the hazardous weather he had encountered; the errors of the company's radio operators at West Palm Beach and Miami . . . "

Recommendations Listed

The Committee urged the company to "restrain the more experienced pilots, encourage caution in the less experienced, and remove any premium on over-boldness or daring." More authority should be given to dispatchers, it said.

"The Committee is of the opinion that the over-confidence of many pilots, together with the inferiority complex of some dispatchers, constitute one of the greatest hazards to the safety of air travel," it added.

There is a need for a greater number and more accurate weather reports by trained observers on ships and land from the Atlantic Ocean, the Gulf of Mexico, West Indies and Central America, that will provide weather forecasting services with the necessary data to forecast storms accurately, the report said, adding that aviation requires that greater emphasis be placed on the qualifications and advanced training of Weather Bureau personnel.

TWA, Railroad Form Joint Company; Will Seek New England Routes

TWA and the New York, New Haven & Hartford Railroad Co. have filed incorporation papers covering formation of a joint company, to be known as TWA-New England Inc., which will file application with the Civil Aeronautics Board for air service to cities in southern New England including New York and Boston.

Marking the first time that such a project has been undertaken by an established airline and railroad, the company will be 55% owned by TWA and will be officered and managed by the airline.

Incorporation papers filed in Delaware on Oct. 27 show that the maximum authorized capitalization is $1,500,000, to be used to carry on a "general transportation business."

Judge Carroll D. Hincks, of the U. S. District Court at New Haven, recently authorized the trustees of the railroad to participate with TWA in the project.

In a memorandum accompanying his order, Judge Hincks stated that "from the public standpoint, the program appears sound. The rapid growth of travel by air is a matter of common knowledge. This has been accomplished through airports generally at some distance from the centers of population. Yet the railroad has and must continue to have stations not generally used to full capacity in about every center of population.

"Through the pooling of the existing facilities of the rails and the air, with a minimum of fresh capital and a minimum of wasteful duplication, the public will have a thoroughly integrated system of transportation including a multitude of stations on a network of rails ready and eager to feed traffic to connecting points serving both the rails and the air on combination tickets."

T. B. Wilson, chairman of the board of TWA, said: "The linking of these two big transportation interests with their vast facilities and experience will work not only to their mutual advantage but also to the benefit of the public . . . The result should be a marked forward step in transportation." He revealed that the new corporation was the result of months of study by both companies.

TWA has for some time been trying to enter the New England territory, has applications on file with CAB for New York-New Haven-Wooster-Boston and Pittsburgh-Williamsport- Binghamton- Albany-Springfield-Boston routes. Hearing on the latter route has been held. Whether one or both of these routes would be operated by the new company was not indicated by TWA.

VIBRATION
giving you trouble?

Long experienced in the design of acoustic analyzing and recording equipment, Electrical Research Products is now working actively with the aircraft industry in its great National Defense effort. Special instruments are being developed for vibration analysis in aircraft, engines and propellers. We can help solve your vibration problems. *Why not write us today?*

Electrical Research Products
76 Varick Street, New York, N.Y.
DIVISION OF
Western Electric Company
INCORPORATED

Four Airlines Blast CAB Examiner for Disfavoring Denver-Kansas City Route

IN FAILING to find a direct Denver-Kansas City route required by the public interest, CAB Examiner Francis W. Brown was guilty of a "most flagrant error," took a "short-sighted" view and made "shocking errors," according to counsel for the various airlines involved in the case.

Appearing in oral argument before the Board on Oct. 27, Continental Air Lines, United, Braniff and TWA claimed that the route was definitely in the public interest and should be established. Each attorney claimed that his airline was best qualified to operate the route.

Public counsel—an attorney employed by CAB to represent the public—previously had disfavored the route, but at the argument admitted that it would be a "close" case.

Mayor Ben Stapleton of Denver, and representatives of Kansas City, Topeka and Salina also urged the Board to take favorable action.

'Retards Aviation'

Examiner Brown made the "most flagrant error that has yet been made in a proceeding of this kind" in not finding the route in the public interest, according to Terrell C. Drinkwater, attorney for Continental. He said that the report was "short-sighted and retards aviation in the west."

U. S. Airways, he pointed out, successfully operated Denver-Kansas City before the 1934 air mail contract cancelations. If such a route showed any degree of success eight years ago, it would certainly be in the public interest today, he added.

TWA wants the route so that it can continue on through Denver to the west coast; United's entrance into Kansas City would upset the competitive balance of the transcontinental carriers, and Braniff should not have the route because additional Denver-Chicago service has not been shown to be necessary, Drinkwater told CAB. Continental, he argued, needs to tap adjacent reservoirs of population, and added that this was CAB's chance to "strengthen a weak link in the air transportation pattern."

Continental had also proposed, in the alternative, an extension of its Pueblo-Tulsa line from the intermediate point of Hutchinson to Kansas City. Drinkwater emphasized that the direct route was preferable, but that if the Board disagreed, the Hutchinson cut-off would represent a "considerable improvement" over existing service.

Less Diversion by UAL

John Lorch, attorney for United, stated that the route is of sufficient importance to warrant government expenditures. If awarded the line, United would divert less traffic from other carriers than if the line were operated by one of the other applicants, he said, adding that United would also operate it at less cost to the government.

Hubert Schneider, of Braniff, said that Examiner Brown first "arrived at his conclusion and then went back to justify it." Braniff, he stated, can perform local service on the route and in addition can carry interline business to Chicago in competition with United. Under the present set-up, neither the Omaha nor the Wichita gateways can serve the need, he said.

Gerald B. Brophy, TWA counsel, charged that Examiner Brown "completely ignored the very vital part of the record in this case" and that his report contained "shocking errors." Brophy urged the Board to give the record "a complete, fair and impartial analysis."

Although TWA would lose money on the route in the first year, the contribution which the route would make to the TWA system would greatly outweigh this loss, he said. He added that TWA has not filed application to continue through Denver to the west coast, but warned that the company would do so if such action was necessary to protect its interests.

Wynne Opposes

John S. Wynne, counsel for Mid-Continent Airlines, intervener, told the Board that the direct route is not necessary, that the area can be served if there are adequate connections. He challenged the Board to invoke Sec. 1002(i) of the Act, which states that "The Board shall, whenever required by the public convenience and necessity... establish through service and joint rates, fares or charges...and the terms and conditions under which such through service shall be operated." He pointed out that MCA would be seriously affected if a direct route was established, "being a low poundage carrier with a high mail rate."

The argument of John Wanner, public counsel, gave the impression that he considered there were factors both for and against establishment of the route, and that CAB would have to decide if the favorable ones outweighed the unfavorable ones. The weak point in an argument for the route is the inadequacy of the intermediate stops, he said, adding that a substantial amount of business could be expected to flow between the terminals. He said that the Hutchinson cut-off "has little to recommend it."

Hot Contest on a Rainy Day

THE TIME: 4:18 on the rainy afternoon of Oct. 27. Place: Civil Aeronautics Board's hearing room. Oral argument on the hotly-contested Denver-Kansas City route, disfavored by a CAB examiner, was in its sixth hour as J. R. Hunter, of Hutchinson, Kan., took the floor to present his case. At the table behind Hunter, left to right, are T. C. Drinkwater, Hubert Schneider, and Gerald B. Brophy, attorneys for Continental, Braniff and TWA, respectively. Between Schneider and Brophy can be seen T. E. Braniff, president of Braniff, and on his right, partially hidden, Robert J. Smith, Braniff vice-president-operations. Behind Braniff is Russell Cantwell, head of the aviation department of the Kansas City Chamber of Commerce, while under the map, on the right, is Clarence Fleming, assistant to the chairman of the board of TWA. Behind the empty chair on the left is Mayor Ben Stapleton of Denver. Not shown are Board members Edward P. Warner, Oswald Ryan, Grant Mason and George Baker, seated to the right of the photographer. In left foreground is the press table.

Airline Statistics Available

Summary of Domestic Airline Operations for year ended June 30, 1941, prepared by AMERICAN AVIATION DAILY, is now available. Reports on 19 individual operating companies cover such subjects as traffic, revenues and expenses, balance sheet, officers and directors, corporations controlled, investments in affiliated companies, experimental and development projects, aircraft equipment and depreciation bases. Bound copies are available at $5 each from AMERICAN AVIATION DAILY, 1317 F St., N. W., Washington, D. C.

Eastern Hires 10 Co-Pilots Monthly

EASTERN Air Lines is hiring co-pilots at the rate of 10 per month and in the event DC-3's on order are delivered in 1942, about 100 more co-pilots will have to be added, EAL President Eddie Rickenbacker said recently. The company now has 320 pilots and co-pilots.

Calling of several pilots into military service has not discommoded EAL's flight organization, Capt. Rickenbacker said, adding that the Civilian Pilot Training Program "has created a pilot 'pool' so to speak, of such magnitude, and of such quality, that we have had no difficulty in obtaining qualified flying personnel even at a time of increasing standards."

ALUMINUM AND STAINLESS STEEL SHEET METAL FABRICATORS

AIRCRAFT COMPONENTS, INC.
VAN NUYS • CALIFORNIA

EXHAUST COLLECTORS
COWLING
SEATS, ETC.

EXCLUSIVELY SUB-CONTRACTORS TO THE AIRCRAFT INDUSTRY

'Pat' Willing to Match

Questioned by AMERICAN AVIATION on Capt. Rickenbacker's $20,000,000 estimate for EAL post-war re-equipment, W. A. Patterson, president of United Air Lines, said he had not stopped to figure exactly what purchases would be.

"If United . . . could acquire the equipment and we were called upon to make commitments tomorrow, we would be willing to order $12,000,000 worth of airplanes," he said. "What will happen following the war depends entirely upon the extent of the impact and let-down in our whole economic system. Considering the $12,000,000 we would make a commitment for immediately, I would be willing to risk a guess that we would go another $8,000,000 following the war, which would pretty well match Eddie's estimate."

ALMA Signs 12 Lines

Twelve of the 16 major domestic airlines have now signed working agreements with the Air Line Mechanics Association, the union states. Latest to sign was Western Air Lines, in October. Previously signed were American, Braniff, Canadian Colonial, Chicago & Southern, Continental, Delta, Inland, Mid-Continent, National, Northwest and Pennsylvania-Central. Not represented, the association adds, are Eastern, Northeast, TWA and United.

Rickenbacker Sees $20,000,000 EAL Post-War Re-Equipment Program

A $20,000,000 re-equipment program by his company, passenger fares of 3c per mile, and first class mail by air have been forecast for the post-war period by Capt. Eddie Rickenbacker, president of Eastern Air Lines.

Testifying at a recent CAB hearing, Capt. Rickenbacker predicted a "period of deepest depression and privation" after the emergency. "Ill-conceived airlines will fail and good airlines which have been subjected to wasteful competition will fail."

Eastern "exercised what seemed to be reasonable financial prudence in not disbursing our resources in the form of dividends and in raising extra capital in the spring of 1940 through the issuance of additional stock," he said. "Because of international developments, we, of course, had to hold these funds as idle money, but we do have the satisfaction of knowing that when the emergency is over, we shall be able without delay to take advantage of the very earliest opportunity to buy from the factories the new and modern equipment which will be needed.

"I believe, however, that a system of the size and nature of ours probably will need at that time a minimum of $20,000,000—instead of $6,000,000 or $8,000,000—for rehabilitation that must come after the national emergency.

"I refer to it as rehabilitation because it is generally agreed that the equipment now used by the best domestic air carriers is already obsolete. Although it functions well mechanically and is safe, it cannot compare with equipment already designed and tested, and therefore our present fleet is exposed to being discarded as junk at any time.

"For more than three years we have been making careful studies of engineering characteristics and of passenger comfort characteristics and of economic advantages to be found in equipment of new design. We shall have to make large expenditures not merely to attract new business at that time but also to hold on to what we have today."

The EAL president added: "If I can get the right equipment I can cut my tariff down to where I think it will have to be cut—3c a mile—and I hope thereby to add to what I have got and develop new business in the form of carrying first-class mail, freight and additional passengers."

Questioned after the hearing, Capt. Rickenbacker predicted that his company would need both large and small flying equipment. Top price for larger ships might be about $200,000, with smaller units as low as $60,000, he said.

'C. R.' Can't Guess

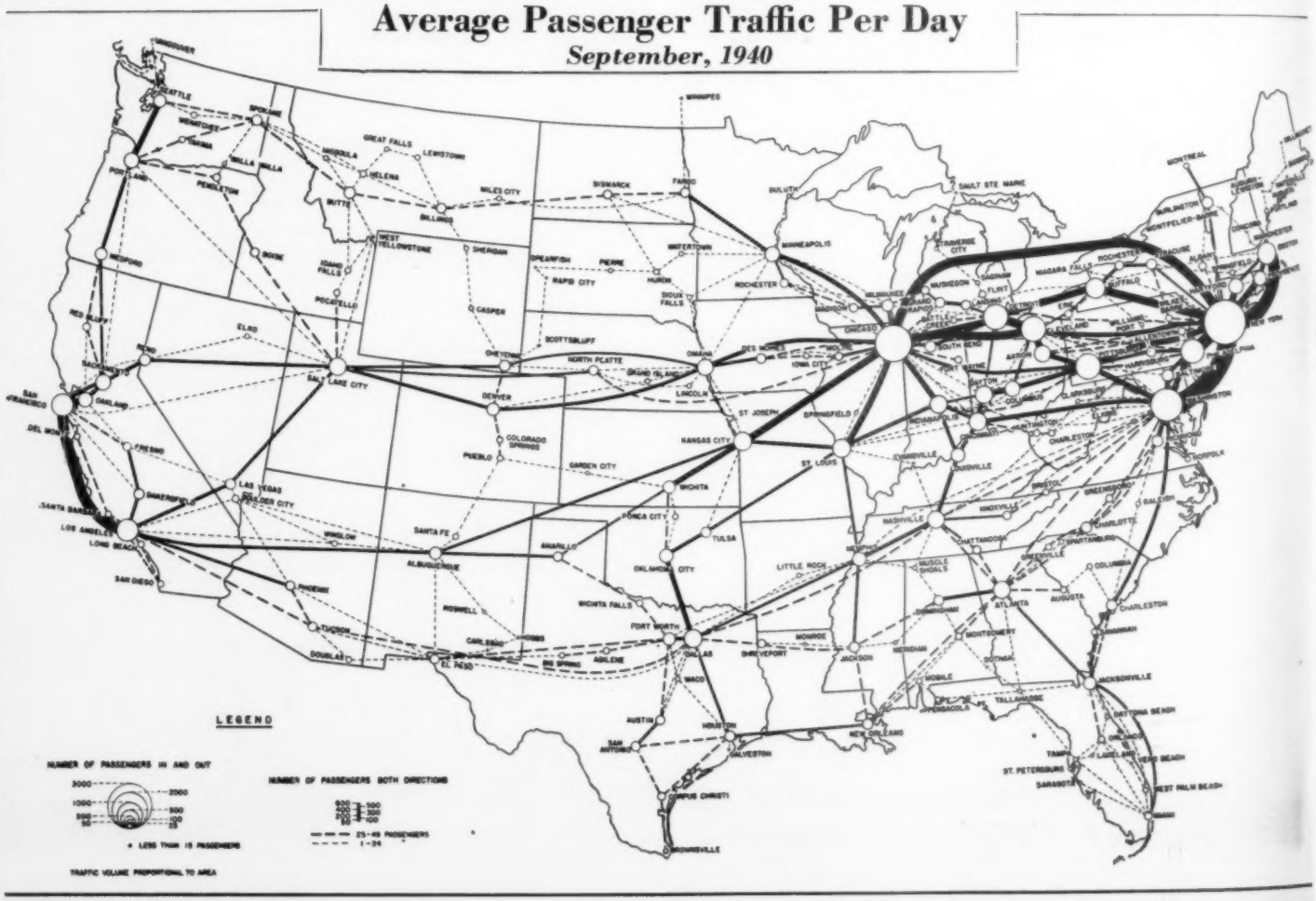
C. R. Smith, president of American Airlines, commenting on Capt. Rickenbacker's post-war estimate, said he cannot guess how much AA will spend for equipment three or four years from now. "As a matter of fact, I am pretty much personally impressed by the fact that whatever amount we estimate is probably going to be overshadowed by what we do, but I have no way now of putting my hands on any tangible figures," he stated.

EAL Sells 'Giro

Eastern Air Lines has sold the autogiro with which it conducted air mail service between Philadelphia airport and the roof of the Philadelphia post office, according to Capt. Eddie Rickenbacker, EAL president. Purchaser is William A. Bohannon, proprietor of a tow-sign advertising service, who claims that the 'giro is an ideal craft with which to tow signs, because it gets off quickly, climbs steeply and flies slowly. EAL's air mail service was operated from July 6, 1939, to July 6, 1940, but was discontinued when the Civil Aeronautics Board refused to issue a certificate. The Board said it recognized the value of the service, admitted that a temporary certificate was desirable, but added that it did not have the power to issue such a certificate when a permanent one was requested.

Average Passenger Traffic Per Day

September, 1940



AIR CARRIER RECORD

C.A.B. APPLICATIONS, HEARINGS, DOCKETS

APPLICATIONS

The city of Melbourne, Fla, has filed a petition with CAB requesting a stop by Eastern Air Lines.

Page Airways has filed application for 5 pick-up routes.

Pennsylvania-Central Airlines has indicated its intention to file application for a route from Norfolk to Detroit via Richmond, Roanoke, Charleston, Columbus and Toledo.

Braniff Airways seeks approval of a second schedule between Amarillo and Oklahoma City. In company's last rate case, the schedule was approved for the period Apr. 8-Nov. 1, 1941. Braniff now asks that it be put on a permanent basis.

CAB DECISIONS

Atlantic City Stop: Eastern Air Lines has been granted a stop at Atlantic City. Complete story on page 28.

EXAMINERS REPORTS

TACA Favored: TACA has been recommended for a route from San Jose to Balboa.

HEARINGS AND ORAL ARGUMENTS

Seaboard Case: Hearing was in progress during the past two weeks on applications of Eastern Air Lines, Naticnal, Pennsylvania-Central, Seaboard and Canadian Colonial for routes down the east coast. Complete story on this page.

PAA Hearing: CAB Examiner J. F. Reilly held hearing Oct. 29-30 on application of Pan American Airways to determine if its acquisition of a minority interest in Aerovias de Guatemala is subject to approval under the Civil Aeronautics Act. If such approval is necessary, PAA asked that it be granted. Company now holds a 40% interest in Aerovias. Principal witness at the hearing was Alfred E. Denby, general manager of Aerovias. He testified that his company now owes PAA about $50,000 which is expected to be paid off by the end of this year. At that time, he added, he will exercise his option to buy 50% of PAA's interest, leaving the latter with 20%. Denby said that he originally asked PAA to join him in the company, not vice versa. He added that he does not consider himself obligated to accept instructions or directions from PAA. Denby testified that he personally controls Aerovias, and "I consider it a sound business."

Denver-Kansas City: Oral argument closed Oct. 27 on the hotly-contested Denver-Kansas City route. Complete story on page 35.

MISCELLANEOUS

Airport Suspension: Pennsylvania-Central Airlines has been authorized to continue its suspension of service at Saginaw-Bay City, Mich., until such time as the airport is approved for DC-3 operations.

Non-Stops Okayed: The following non-stop schedules have been approved by CAB; United Air Lines between Cheyenne and Boise, Continental Pueblo-Albuquerque, and TWA Kansas City-Amarillo.

CALENDAR OF HEARINGS

Dec. 8—American Airlines, route from El Paso and/or Ft. Worth to Mexico City.

Jan. 12—TWA, Chicago & Southern, Eastern, for Indianapolis-Detroit, St. Louis-Detroit and Memphis-Detroit routes.

Classified Ads

WANTED—Experienced Link Trainer Operator, capable of operating and supervising Link Training. Furnish qualifications, experience and snapshot in first letter. Continental Air Lines, Inc., Municipal Airport, Denver, Colorado.

Navy Withdraws Request

Navy Dept. has withdrawn its request that the Civil Aeronautics Administration operate the airport traffic control tower at Floyd Bennett Field, N. Y. No reason for the withdrawal was given.

Atlantic Coast Hearing Features Hot Words by Airline Presidents

HOTLY-worded statements by three airline presidents were made during the past fortnight at a hearing before CAB Examiner Francis W. Brown on application of Canadian Colonial Airways, Eastern, National, Pennsylvania-Central and Seaboard Airways for new routes along the Atlantic coast.

As this issue went to press, it was expected that two more presidents—Alvin P. Adams of Seaboard, and C. Bedell Monro of PCA— would testify.

EAL President Eddie Rickenbacker assailed other airlines for filing applications for routes which would "substantially duplicate" those of EAL and which would be "wasteful and injudicious and lacking in value . . ." If EAL is to be "assaulted or raped" it will not be able to maintain the present high standard of its service and will not have funds for necessary post-war financing, Capt. Rickenbacker said.

In effect, he called upon the other airlines to stick to their own territories for the benefit of both themselves and EAL.

EAL's success on its New York-Miami and New York-New Orleans routes has been due, Capt. Rickenbacker said, to (1) rigid economy and efficiency of operations, (2) a thorough job of exploitation and selling and (3) excellence of service rendered. EAL's operating costs, he claimed, have been lower than any other major carrier.

Through addition of stops to its present routes, EAL can furnish all the service proposed by the other applicants and can do the job with no additional airplanes and very little additional expense, he said. Other applicants would need additional equipment and pilots and large government mail pay expenditures, he added.

Baker Disagrees

National's President G. T. (Ted) Baker, seeking a New York-Florida route, disagreed with "The Captain." EAL, he said, has not been able to handle the business in its territory adequately. National is now hemmed in on one side by EAL and on the other side by the Gulf of Mexico, he claimed.

If his proposed route is established, the public will get the benefit of the "latest developments" in air transportation, Baker said. Among the developments mentioned was sleeper service, which he said would be established as soon as equipment became available.

Canadian Colonial's out-spoken Sigmund Janas warned the examiner that if EAL's applications were granted, the eastern seaboard would be "completely closed as far as competition is concerned." He denied that his proposed New York-Nassau route would compete with EAL, claiming it would relieve congestion, especially between New York and Charleston. EAL has always been a "through-route line," whereas CCA would serve the intermediate points as well, he said.

'CCA Needs Mileage'

If awarded the route, Janas explained, CCA would obtain much-needed additional mileage which would enable it to reduce its per-mile operating costs. In most cases a "short route . . . cannot be economically operated," he added.

Questioned by Leslie Craven, Seaboard attorney, as to whether a Nassau route would not enable CCA to "get into Miami by the back door," Janas said he had "never even thought of it." He also stated that he has no plans at present for operations beyond Nassau.

"I know that Mr. Rickenbacker testified that Eastern's advantageous operations were due to management skill, but I would like to see what would happen if Eastern had a reasonable amount of competition between New York and Miami and Chicago and Miami," he said.

A motion by both airline and public counsel to have Seaboard's application dismissed on the grounds that the company had not furnished full financial data and exhibits was overruled by Examiner Brown. Craven explained that the airline was in the process of divorcing itself from the railroad and that financial exhibits would be furnished as soon as possible.

PROVED IN SERVICE...*Now used on all American military and transport airplanes*

MADE in more than 2500 combinations of type, size, thread system, and material . . . to meet every aircraft requirement . . . Elastic Stop Nuts are universally recognized as the standard fastening device of the industry.

Write for catalog illustrating many aircraft applications.

ELASTIC STOP NUT CORPORATION
2354 VAUXHALL ROAD • UNION, NEW JERSEY

Elastic Stop SELF LOCKING NUTS

No More Static Here

Airport Control Shifts to Ultra-High in '42

Long Range Program To Rule Out Present Frequencies Gradually

By LEONARD EISERER

BARRING a tie-up of equipment by the defense program, the delayed swing of aviation to ultra-high airport control frequencies for relatively static-less radio communications will definitely get underway early next year.

Latest word from the Federal Communications Commission is that the regulation requiring the installation of ultra-high frequency equipment at the busiest airports starting Jan. 1, 1942, will be carried through. To utilize these facilities, the commercial airlines are preparing to equip their transports with receiving apparatus only recently perfected for this purpose. The Jan. 1 date affects an estimated 40 airports.

This debut of ultra-high frequencies in regular airport traffic control service has been twice postponed—first from January, 1940, to January, 1941, and then to January, 1942—with the time extensions occasioned largely by the need of additional time for instrument development, the reluctance of cities to invest in the new equipment, and the difficulty of obtaining deliveries in view of defense activities.

Next year, however, the aviation industry will take an important stride toward improved radio communications when the 200-400 kc. band commonly used for airport control purposes is supplemented at numerous points throughout the country with frequencies above 129 megacycles.

Terms of Regulation

According to FCC regulations governing aviation services, as amended last Feb. 11, all airports having 15 or more scheduled aircraft landings daily must supplement their 278 kc. service with UHF beginning Jan. 1, 1942.

Airports having between six and 15 such landings daily must offer similar UHF service after July 1, 1942, and all remaining airports after Jan. 1, 1943, "provided, however, that upon application therefor the Commission may exempt any station from the high frequency service requirement when it appears that in the preservation of life and property in the air, such service is not required at that station."

While up to now no formal indication regarding enforcement of this regulation has been given by FCC, officials have stated that further postponement of the effective dates is not being considered at this time. General attitude of Washington aviation officials involved is that the program will be pushed as close to schedule as possible. Rather lenient enforcement of the requirements is expected, especially since the defense program may in some cases delay delivery of the new equipment.

In at least one respect the national defense program will lend impetus to spread of UHF service across the country, since UHF equipment is being installed by the federal government at each of the 38 airport traffic control towers being taken over by the Civil Aeronautics Administration for the regulation of military and civil air traffic.

Cost of the equipment to be provided at the airports affected by the FCC regulation is estimated between $2,000 and $3,000, on the average, for each installation.

Airline investments in new UHF ground and plane equipment will be substantial, including some 400 units in orders placed through Aeronautical Radio Inc. with Western Electric Co. of Kearny, N. J. The equipment is now being type tested by the CAA, prior to fulfillment of the order.

Regarding the long-range aspects of the program, some CAA officials consider it a conservative estimate that three years may be required to complete the change-over from low to ultra-high frequencies. While airlines, it is pointed out, will switch over to UHF in a relatively short time, the installation of UHF equipment in non-air carrier planes may be expected to lag far behind.

Not to Be Abandoned

A necessary feature of the transition period is that present frequencies will not be abandoned by the various airports until all radio-equipped planes can get along on UHF alone. Thus, recent expenditures of municipalities in equipment for currently used frequencies will not be converted into losses, since such equipment will be in partial use for several years to come.

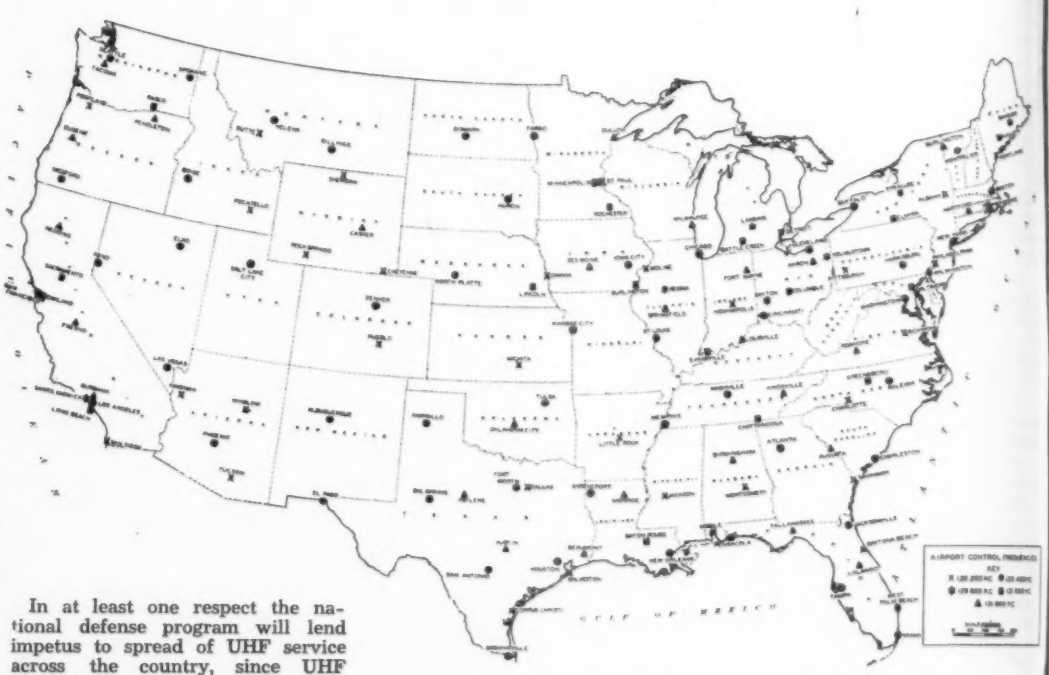
One disadvantage to the airlines during the transition will be the cut in payload when UHF equipment is added to already weighty radio devices. The increase in weight is estimated at about 100 pounds per plane.

The general FCC plan for assignment of ultra-high airport control frequencies, illustrated by the accompanying map, is designed so that as many points as possible will use a single frequency, keeping the number of additional frequencies necessary at a minimum.

Goal aimed at by FCC, in cooperation with the CAA, is that when the program is in full operation, any of the civil airways—with few exceptions—may be flown by the use of no more than four frequencies. This system, it is pointed out, will make possible the use of the simplest type of pre-tuned receiver.

In the interest of interference reduction, UHF assignments will be made, so far as possible, in accordance with this general formula:

When the distance separation is less than 60 miles, the frequency separation will be 400 kc.; with distance separation of 60-200 miles the frequency separation will be 200 kc.; and at points over 200 miles apart the same frequency may be used.



Frequencies Assigned to Avoid Interference

Government Waste

But a Good Idea Just the Same

Lieut. Russ Spicer, flight commander at the Randolph Field basic flying school, sat on his parachute under the wing of his plane, watching his cadets land. A woman and her husband approached.

"Is that your parachute?" she asked.

Lieut. Spicer said it was.

"Did you ever have to use it?" she asked.

"No, not so far," replied the flight commander.

"That is just like the government," the woman remarked to her husband as they walked away, "buying expensive things and never using them."

Civil Aviation Insurance Conference Looks to Post-War Flying Expansion

Activities Aimed at Sportsmen Pilots, Students and Schools

THIRTEEN insurance companies, bent on becoming specialists in civil aviation insurance after the war, have formed the Mutual Aircraft Conference—a new departure in the insurance field.

Counting on post-war private flying prosperity, these firms intend to concentrate their aviation activity on small planes for sportsmen pilots, flying students, flying schools, corporations operating their own ships for transporting company personnel, and similar types of plane owners.

Government limitation on private plane sales and requisitioning of private ships for defense purposes (the government doesn't insure planes) do not make the aviation insurance picture look very bright for the immediate future, reports William H. Rhodda, of the engineering staff of American Mutual Alliance and secretary of the Conference.

"But we are looking ahead to the post-war period," Rhodda explains, adding, "We are getting into the field now to build up experience so that when the emergency is over we will not be new in aviation."

Three established underwriting groups—Associated Aviation, United States Aviation and Aero Insurance—now write virtually all civil aviation insurance in the country.

Members of the new Conference are said to be the first mutual companies in the aviation field, all previous companies having been stock firms. Also, preceding groups usually operated through "pools," whereby the insurance was placed in groups through special offices instead of going through home offices.

Conference member firms will actually write the insurance themselves, with the Mutual Aircraft Conference acting as a supervisory board to set standards for policies and rates for member firms, not as an underwriting pool.

The Conference will cover most of the present aviation field, Rhodda states, with the exception of transport. Each firm can write $5,000 individually and "other firms can participate up to almost any total." The 13 mutual fire insurance companies have total assets of $60,556,241.

Among the important results the organization's operations are expected to achieve is a reduction of about 15% in the cost to owners of insuring their planes against loss or damage. The initial rates will be in line with those now in use in the aircraft insurance fields, the Conference claims, but at the end of the policy period there will be returned to the policyholder a percentage of his original premium as a saving or "dividend." Past experience of the companies indicates that this return should be approximately 15%.

Coverages available will range from simple fire insurance on hulls up to broad forms of all-risk policies indemnifying owners from loss or damage to their planes from virtually any cause. No insurance of the owner's liability for damage by his plane to the persons or property of others, however, will be written by conference members.

The expectation is that by concentrating upon the better type of plane and owner, and through close inspection of planes and hangars and investigation of pilot ability, the losses among owners insured in Conference companies will be lower than the average. This method has resulted in regular rate reductions over a period of many years in other insurance lines which once were regarded as hazardous, it is pointed out.

Sponsored by the American Mutual Alliance, the Conference has among its purposes the prevention of competition among member companies so that they may be in a better position to compete with non-member companies.

Conference members are: Badger Mutual Fire Insurance Co., Milwaukee; Central Manufacturers Mutual Insurance Co., Van Wert, O.; Federal Mutual Fire Insurance Co., Boston; Hardware Dealers Mutual Fire Insurance Co., Stevens Point, Wis.; Hardware Mutual Insurance Co. of Minnesota, Minneapolis; Lumbermen's Mutual Insurance Co., Mansfield, O.; Millers' Mutual Fire Insurance Association of Illinois, Alton, Ill.; Minnesota Implement Mutual Fire Insurance Co., Owatonna, Minn.; National Retailers Mutual Insurance Co., Chicago; Pennsylvania Lumbermen's Mutual Fire Insurance Co., Philadelphia; Union Mutual Fire Insurance Co., Providence, R. I.; United Mutual Fire Insurance Co., Boston; and Western Millers' Mutual Fire Insurance Co., Kansas City.

WPA Trainees Learn Prop Swinging

AS ONE of the things every well-trained airport ground serviceman should know, the proper way to swing a propeller is here demonstrated by an instructor in one of the airport ground classes sponsored by the CAA, WPA and Office of Education.

Under the program, men from WPA rolls are trained to service planes and prepare them for flight, much in the same manner that filling station attendants check and re-fuel automobiles. No effort is made to teach the trainees aviation mechanics; rather, the course covers much of the work about an airport not requiring the attention of a certificated mechanic, such as fueling, starting, washing, parking and storing planes.

Special training is given in fire fighting, accident procedures, and in federal, state and local aviation regulations.

No payment is made to the airport at which classes are held, since the manager cooperating with the program gets a return for the use of his facilities in the work done by the class.

To date 69 classes have completed the three-month course at airports throughout the country, each group containing an average of 10 students.

Strict Regulation of Private Flying Stressed for U. S.

THE U. S. is urged to follow England's lead and effect strict control over private flying to forestall sabotage, in a recent article by William Courtenay, aeronautical correspondent of the London *"Daily Sketch."*

Pointing out that the U. S. possesses a private air force comparable in numbers to the German Luftwaffe and some planes of which might be in the hands of saboteurs, Courtenay cites England's methods of dealing with this problem.

"In England," he states, "we had no more than 700 private owners of planes at the outbreak of war . . . As the Air Ministry took charge of all air space over Britain and adjacent waters for defense purposes, private aircraft were grounded on Sept. 3, 1939. Some 500 of these privately owned planes were of a standardized type similar to the primary trainers built by the same manufacturers.

"The need for trainers was so great two years ago that the British government bought and drafted them all for flying schools. The remaining miscellaneous types remain grounded in hangars at controlled airfields where the private owner cannot get at them. And since every flight over Britain is routed and controlled, any unauthorized person attempting to fly by day or night without being routed officially risks being shot down.

"In Britain every private owner's aircraft was registered nationally at the Air Ministry. It bore a series of registration letters like a motorcar; every pilot had to carry certain documents and logbooks in his aircraft, and at all airfields movements of aircraft not registered there always were logged . . .

"Obviously some sort of federal control is needed (in the U. S.) in times like these if planes are not to be used to the detriment of the defense policy. The danger grows apace as more and more flivver planes pass from factories to private owners whose only qualification for ownership need be that they are citizens.

"It is evident that the time is at hand when the private owner, on grounds of national security, must face restrictions. Some federal plan with which all states cooperate is needed. Under it private flying, for instance, might be limited to daylight. Every aircraft, might have to carry a national registration mark; be kept at an assigned and approved airfield; flown under authorized control; routed and logged for every journey, and, if necessary, grounded."

Now writing and lecturing in the U.S., Courtenay has been officially authorized in Britain to lecture here on Royal Air Force activities. Courtenay was a soldier and pilot in the first World War, has been a sportsman pilot in England.

Activities of Investment Firms Give Clue to Trading Trends

By F. H. STEVENSON

WITH public interest in aviation stocks increasing sharply since advent of the war brought tremendous orders to manufacturers and skyrocketed airline travel, the question of who is buying and who is selling what securities is one of paramount importance. A direct answer to this question can, of course, be given only by the traders themselves—and they, as usual, are not talking. However, a good indication of market activities among the larger operators can be gained from the reports of investment trusts in this field.

An analysis of the portfolios of two of the larger investment trusts specializing in aviation securities reveals that while there is considerable unanimity as to which individual issues should be represented therein, ideas on lightening or adding to the blocks held varied widely—a not unusual situation among the largest traders or even alleged "insiders."

Theory Cited

One of the theories behind investment trusts is that by providing wider diversification of holdings than can be conveniently achieved by the average individual investor and by offering a market-wise management, they represent an opportunity for a person with small capital to invest much more safely than by entering the market on his own initiative. The merits and workings of this theory will not be discussed here. However, bearing it in mind, it is interesting to review the decisions of the managements of the two companies studied.

These companies are National Aviation Corp. and Aeronautical Securities Inc. and their portfolios are as of Sept. 30, 1941, as compared with the same date in 1940. National showed 32 individual issues held and Aeronautical 25. Of this total, the portfolios showed holdings by the trusts of securities of 17 of the same companies— a large percentage numerically, but not necessarily conclusive in so far as total shares held is concerned or their market value. There, however, the similarity between the conclusions of the two managements seems to end abruptly.

Of the 17 securities held by both firms, they were unanimous as to whether to buy, sell or hold in only eight cases—in four instances they added to holdings, in three they lightened them and in one no change was reported. In half as many cases, four, one company bought more securities of a company while the other sold some of its holdings of the same firm. In two cases one firm bought more of a security while the other stood pat and in three instances one sold part of its holdings while the other showed no change.

Actions Reviewed

A clearer picture can be gained by reviewing their actions in individual securities. Both firms added large blocks of Curtiss-Wright Corp.; Northwest Airlines Inc.; Pennsylvania-Central Airlines Corp. and United Air Lines Transport Corp.

On the other hand, both companies closed out their entire holding of Canadian Colonial Airways Inc. and sold large blocks of Lockheed Aircraft Corp. and Glenn L. Martin Co.

Perhaps the most interest is in those cases where there is an apparent difference in convictions. National bought American Airlines Inc., while Aeronautical sold; National bought Bendix Aviation Corp. while Aeronautical sold; National sold Eastern Air Lines Inc. while Aeronautical bought; and National disposed of a large block of Pan American Airways Corp. shares while Aeronautical's holdings remained unchanged.

It is also interesting to note that National added considerably to some of its holdings which are not represented in Aeronautical's portfolio. These additions were: Bell Aircraft Corp.; Boeing Airplane Co.; Cessna Aircraft Co.; Parker Appliance Corp.; Thompson Products Inc.; Vultee Aircraft Inc.; and Mid-Continent Airlines Inc.

At the same time, Aeronautical bought shares in companies not represented in National's holdings as follows: Aero Supply Mfg. Co., Inc.; Air Associates Inc.; and Fairchild Engine & Airplane Corp.

It should be remembered that the buying or selling of these securities does not necessarily indicate their intrinsic worth or probable market action, but merely represents the judgment of the management as to market movements, whether too much of a certain security is being held, whether some other security is more attractive and thus selling out of another is desirable, or any of many other factors too numerous to mention. It might also be pointed out in passing that management of investment trusts, of which there are hundreds, do not always guess right.

The portfolios of the two companies as of Sept. 30 and changes from a year ago are shown in the tables at left:

Prediction Confirmed

Confirming predictions in this section of the preceding issue of AMERICAN AVIATION, two additional applications for unlisting trading of aviation securities on exchanges have been made and many more are expected. San Francisco Stock Exchange applied to the Securities & Exchange Commission for unlisted trading privileges in Boeing Airplane Co. $5-par common and Douglas Aircraft Co., Inc., no-par capital stock. Hearing on the applications has been set for December 2 in the San Francisco office of the SEC.

Also, it has been learned that the Commission is conducting a

(Turn to page 44)

National Aviation Corp.

Manufacturing Companies

Security:	Shares Owned	Changes
Bell Aircraft Corp.	23,317	plus 7,400
Bendix Aviation Corp.	2,600	plus 2,600
Boeing Airplane Co.	14,200	plus 11,200
Brewster Aeronautical Corp.	.....	minus 4,000
Cessna Aircraft Co.	4,100	plus 4,100
Consolidated Aircraft Corp.	10,000	minus 300
Continental Aviation & Engineering Corp.	*20,000	Unchanged
Curtiss-Wright Corp.	25,000	plus 2,500
Curtiss-Wright Corp. "A"	20,000	plus 800
Douglas Aircraft Co., Inc.	5,000	Unchanged
Grumman Aircraft Engineering Corp.	10,000	plus 800
Irving Air Chute Co., Inc.	.....	minus 900
Lockheed Aircraft Corp.	20,000	minus 200
Glenn L. Martin Co.	10,000	minus 400
Parker Appliance Corp.	*3,000	plus 3,000
Thompson Products, Inc.	2,000	plus 2,000
United Aircraft Corp.	15,900	Unchanged
Vultee Aircraft, Inc.	4,600	plus 3,300

Airline Operating Companies

American Airlines, Inc.	5,000	plus 1,500
Canadian Colonial Airways, Inc.	.....	minus 5,000
Chicago & Southern Air Lines, Inc.	*3,000	Unchanged
Chicago & Southern Air Lines, Inc., V. T. C.	*10,000	plus 3,000
Eastern Air Lines, Inc.	9,000	minus 1,000
Mid-Continent Airlines, Inc.	*11,500	plus 1,500
Northwest Airlines, Inc.	10,500	plus 5,500
Pan American Airways Corp.	20,000	minus 10,792
Pennsylvania-Central Airlines Corp.	17,300	plus 4,400
Transcontinental & Western Air, Inc.	9,000	Unchanged
United Air Lines Transport Corp.	12,600	plus 3,800

Securities Without Readily Ascertainable Market Value

American Export Lines, Inc., 5% cum. pfd. WW	1,500	Unchanged
Chandler-Evans Corp.	2,755	Unchanged
Vidal Research Corp.	4,325	plus 4,325

* Traded in the over-the-counter market.

Aeronautical Securities Inc.

Common Stocks:	Shares Owned	Changes
Aero Supply Mfg. Co., Inc., Class B	600	plus 600
Air Associates Inc.	1,000	plus 200
American Airlines Inc.	1,000	minus 200
Bendix Aviation Corp.	1,000	minus 200
Canadian Colonial Airways Inc.	.....	minus 1,000
Curtiss-Wright Corp.	1,000	plus 1,000
Douglas Aircraft Inc.	700	minus 400
Eastern Air Lines Inc.	2,800	plus 300
Fairchild Aviation Corp.	1,000	Unchanged
Fairchild Engine & Airplane Corp.	2,500	plus 500
Grumman Aircraft Engineering Corp.	1,400	minus 100
Irving Air Chute Co., Inc.	600	Unchanged
Lockheed Aircraft Corp.	1,900	minus 600
Glenn L. Martin Co.	1,400	minus 600
Northwest Airlines Inc.	1,000	plus 1,000
Pan American Airways Corp.	1,500	Unchanged
Pennsylvania-Central Airlines Corp.	3,000	plus 1,000
Sperry Corp. V. T. C.	1,000	Unchanged
United Aircraft Corp.	1,700	minus 400
United Air Lines Transport Corp.	4,200	plus 1,700
Wright Aeronautical Corp.	100	Unchanged
Preferred Stocks:	**Shares Owned**	**Changes**
Aero Supply Mfg. Co., Inc., Class A	400	minus 100
Chicago & Southern Air Lines, Inc., conv. pfd.	600	Unchanged
Curtiss-Wright Corp., Class A	1,500	Unchanged
Piper Aircraft Corp., conv. pfd.	400	Unchanged

Reynolds Acquires Fletcher Stock

To Southern California's growing list of aircraft manufacturers has been added the name of Richard J. Reynolds, member of North Carolina's nationally prominent tobacco family, who recently acquired about 30% of the stock of Delta Air Lines.

Wendell S. Fletcher, president of Fletcher Aviation Corp., Burbank, Cal., has disclosed that Reynolds acquired an interest which made him one of Fletcher's largest stockholders.

One immediate result of Reynolds' entry into the company will be an expansion program to take care of a demand for stepped up production, Fletcher said.

. . . another Curtiss-Wright **FIRST**

The CURTISS AT-9

. . . the quicker step from Trainer to Bomber

The Curtiss AT-9 is the most recent of a line of trainers whose history began with the famous Curtiss JN-4 in the days of World War I.

DESIGNED to save thousands of precious hours of advanced training, the new Curtiss AT-9 provides the United States Army Air Corps with a new and quicker step from single-engine trainers to speedy pursuit or multi-engine bombers.

The new trainer simulates the flight and control characteristics of modern high-speed twin-engine military aircraft. Its design fortunately is such that it is ideally adapted to mass production, a vital factor in developing the equipment necessary for training the thousands of pilots needed for the nation's defense.

This Curtiss "Transition Trainer" is powered with two 280-horsepower radial engines and has a top speed in excess of 200 miles an hour. It has two seats side by side with provision for two additional observers' seats immediately back of the pilots.

CURTISS-WRIGHT

CORPORATION

AIRPLANE DIVISION

BUFFALO, NEW YORK · COLUMBUS, OHIO · ST. LOUIS, MISSOURI

Current Financial Reports

Douglas 9-Month Profit Totals $10,733,046; Taxes Up 500%

ALTHOUGH Douglas Aircraft Co. reported a sizeable increase in net profit for the first nine months of its current fiscal year as compared with the same period in 1940, the ratio of profit to sales was cut almost in half. The company in the 1941 period ended Aug. 31 showed a profit of $10,733,046 on sales and billings of $110,520,731, or a ratio of about 9.7%, as compared with profit of $7,288,335 on sales of $45,430,275, or a ratio of about 16.0%, in the comparable 1940 months.

At least a partial explanation of the drop may be found in a release by the company which states the "profit and loss statement disclosed an increase of more than 500% in provision for federal income and excess profits taxes in the first nine months of 1941. In the first nine months of 1940 the amount provided for these taxes was $2,063,831, while in 1941, up to Aug. 31, the company provided $10,844,243 for federal taxes. These amounts are exclusive of state and local taxes, also substantially increased for 1941." Increases in operating expenses probably also contribute substantially to the drop in the profit ratio.

Backlog Given

Backlog of the company on Aug. 31 was $653,094,006, of which $530,477,614 was in U. S. government orders under cost-plus-fixed-fee contracts. Additions to the backlog between May 31 and Aug. 31 were $257,671,646.

"As in the preceding year," the company reports, "net profits reported in the first nine months of 1941 were derived principally from sales to others than the U. S. government, although certain unprofitable government contracts resulting in losses in previous periods are rapidly nearing completion and will cease to be a factor in the near future.

"Important gains in Douglas contributions to the nation's defense production are reflected in an increase of 87% in deliveries of airplanes in the nine-month period of 1941 over a similar period in 1940. Of the $110,520,731 in sales and billings, $85,093,710 was in completed deliveries and $25,427,021 was in billings for work completed under cost-plus-fixed-fee contracts. Most of these contracts will be processed through the new plant in Long Beach which was completed Oct. 17.

Working Capital

"Working capital of the company at the close of the third period ending Aug. 31, 1941, amounted to $20,600,203 and the ratio of current assets to current liabilities was 1.7 to 1 on that date. Cash on hand on Aug. 31, 1941, was $20,231,176, in which there was included $8,903,691 of unexpended customers' deposits. This compares with $32,718,533 on Aug. 31, 1940.

"In the face of expenditures of well over half a million dollars per day, adequate reserves for operating funds are vital not only to the company but to the nation. Under existing conditions, the company must at all times be ready to meet constantly increasing and unpredictable burdens of taxation, make large investments in new plants and equipment, and finance heavy new expenditures in diverse and unexpected undertakings resulting from the government's widespread defense program."

Balance sheet as of Aug. 31: Assets: cash, $20,231,176; accounts receivable, $9,966,638; inventories after application of payments thereon, $20,781,842; current assets, $50,979,842; property plant and equipment, $9,029,977; and total assets, $63,042,225.

Liabilities: accounts payable and accrued liabilities, $10,378,982; deposits receivable on contracts in excess of expenditures thereon, $8,903,691; provision for federal income taxes, $11,096,781; total current liabilities, $30,379,454; capital stock authorized 1,000,000 no-par shares, issued and outstanding 600,000 shares, $6,000,000; capital surplus, $3,993,441; and earned surplus, $21,705,511.

Jacobs Aircraft Engine Co.

In another amendment, company states that, based on its June 30 balance sheet (after excluding deferred charges, amortized value of development cost of aircraft engines and incorporation expenses), the net tangible asset value of the 618,546 capital shares now outstanding would have been 90c per share.

This does not give effect to the sale of 15,000 shares of stock on Aug. 5, 1941, for $30,000 representing the conversion of a liability to certain officers & employes which appears in the balance sheet nor to the contingent liability in the amount of $131,246, if asserted. Company may be subject to penalties of that amount for late deliveries of engines to the Canadian government. However, if a letter received from an official of the latter setting forth a different schedule of deliveries effects an amendment to the contract, the penalties would amount to about $16,200.

On Aug. 19 stockholders approved an incentive compensation plan providing that in December of each year in which the company has net earnings, before Federal and state income and excess profits taxes, there shall be withdrawn from earnings for the first 11 months and from the estimated net for December a fund equal to the following percentages:

2% of the first $250,000; 3% of net in excess of $250,000 but not over $500,000; 4% of net in excess of $500,000 but not over $750,000; 5% of net in excess of $750,000 but not over $1,000,000; and 8% of net over $1,000,000.

Distribution is determined each year by the board and is set for 1941 as follows: C. J. Abbott, president, 22½%; J. Story Smith, vice president, secretary, treasurer, 20%; A. R. Jacobs, vice president, 20%; H. M. McFadgen, vice president, 20%; and D. F. Turner, plant manager, 17½%. J. A. Harris, 3rd, chairman, is to get 1% of net up to $1,000,000 and 2% of any above this figure.

HOW TO SOLVE A TOUGH PROBLEM...

CHRISTMAS is just around the corner. The smart gift for an aviation friend or business associate is American Aviation—24 fortnightly reports on vital developments in our great and growing industry.

Give a Gift that will be appreciated

FILL IN THIS CARD, NOW →

AQUATITE

THE

AIRCRAFT PLYWOOD

U. S. Army and Navy Specifications
British V_3 Specifications
or
Individual Specifications

ENGINEERED FOR AIRCRAFT

Twenty-five Years Experience in Aircraft Plywood

CRESCENT PANEL CO.
Louisville, Kentucky

INDIANA VENEER & PANEL CO.
New Albany, Indiana

More Public Financing

New Rohr Aircraft Stock Issue Expected to Yield $461,000

THE TREND toward public financing of aircraft companies, reported in the Oct. 15 issue of AMERICAN AVIATION, received additional emphasis late last month when Rohr Aircraft Corp., Chula Vista, Cal., manufacturer of aircraft parts, filed a registration statement with the Securities & Exchange Commission covering 200,000 shares of $1-par capital stock to be offered at $4.40 per share.

Of the total, 135,000 shares are to be sold by the company and 65,000 by Consolidated Aircraft Corp. Total proceeds are estimated at around $461,000. The company's portion of the proceeds will be used for contemplated payments to subcontractors, payment of debt and increase in inventories. Lester & Co., Los Angeles, is named as the principal underwriter.

The company requested that the statement be given an early effective date because it "believes it is an important production unit of equipment necessary for national defense and the funds . . . are necessary to increase . . . registrant's production." Rohr also said it is "absolutely necessary" that the closing date take place prior to Dec. 17, but "it would be very desirable that the closing date take place prior to that time since Consolidated Aircraft Corp. insists on selling all its holdings . . . (in Rohr) . . . prior to Dec. 31, 1941, in order to avoid any criticism which may result by reason of it holding a substantial amount of stock in one of its subcontractors."

Sept. 30 Backlog

Company's backlog was in excess of $10,000,000 on Sept. 30, consisting of orders from Consolidated and Lockheed Aircraft Corp., all national defense business.

Rohr's parts production falls into four main categories: cowling; power plant assemblies; boom doors; and bomb rack adapters. The company in the past has installed automatic pilots and bomb-sight supports in a group of four-engine bombers and bomb rack converters in certain American planes to permit such racks to carry British bombs.

Rohr buys about 25% of parts for power plant assemblies and about 10% of parts for cowling from some six manufacturers. Only a flap control mechanism is made under patents or secret process and the company says it can make all the other parts itself.

Personnel: Fred H. Rohr, president, treasurer, general manager; J. E. Rheim, vice-president, sales manager; E. P. Campbell, secretary, comptroller; E. M. Lacey, factory manager, director; and F. H. Nottbusch, assistant secretary, director.

Holdings of $1-par capital stock as of Oct. 15: Rohr, 40,000 shares; Rheim, 3,350; Campbell, 1,850; Lacey, 4,000; Nottbusch, 1,233; Harlan D. Fowler (director until Oct. 16 and vice president until May 31, 1941), 500; Consolidated Aircraft, 32,500; and Reynolds Metals Co., 15,000. Rohr donated to Consolidated 7,500 shares of 37,500 previously released from escrow to him. Consolidated "desired to receive by way of donation" the shares because of Consolidated's "reluctance to bear the cost" of any promotion by a company engaged in an enterprise "closely related to the business" of Consolidated.

Salaries in year ended July 31 were as follows: Rohr, $9,833, plus $26,054 or 10% of company's profits (estimated salary for current fiscal year, $18,000, plus 10% of net profits); Rheim, $7,160 for Aug. 14, 1940, to July 31, 1941 (estimated at $7,200 this year); Campbell, $6,968 for Aug. 26, 1940, to July 31, 1941 (estimated at $7,200 this year); Lacey, $7,355 for Aug. 12, 1940, to July 31, 1941 (estimated at $6,000 this year); Nottbusch, $4,663 (estimated at $5,500 this year); and Fowler, $2,750. Rohr has a contract as general manager from Sept. 16, 1940, to July 31, 1945, under which he gets 10% of net profits after certain deductions.

Company employed 978 workers as of Oct. 1. Deliveries were as follows: 1940: Oct., $1,978; Nov., $5,858; Dec., $22,563; 1941; Jan. $77,224; Feb. $179,729; Mar., $282,-165; Apr., $366,838; May $281,-849; June, $120,810; July, $154,469; Aug., $219,789; and Sept., $204,022. Raw materials are furnished mainly by customers, but operations are being changed so that company will hereafter purchase them.

Company has 300,000 shares of stock outstanding, including 150,000 shares paid as a stock dividend on Nov. 1, out of 1,000,000 shares authorized. Proceeds of the present financing, estimated around $461,200, will be used as follows: payments to subcontractors $125,000; federal income and excess profits taxes for year ended July 31, $262,500; and inventories $73,700.

Statement of income from incorporation on Aug. 6, 1940, to July 31, 1941, shows sales, $1,493,488; cost of goods sold, $648,933; expenses, $227,-816; federal and state taxes, $338,-258; and net income, $288,883.

Balance Sheet as of July 31: Assets: cash, $331,384; accounts receivable customers $113,110; other accounts receivable $1,973; inventories $276,719; total current assets $723,187; property, $743,463; deferred charges $11,345; total assets $1,-477,996. Liabilities: accounts payable trade $30,306; EPF purchases $89,510; notes payable $46,000; due to Rohr $26,054; estimated federal & state income taxes $338,233; total current liabilities $601,007; mortgage notes payable under EPF contract $500,000; capital stock $150,000; and earned surplus $226,988.

Glenn L. Martin Co.

Firm reports an increase of $3,000,000 as of Sept. 2 to $16,000,000 in its 1¾% promissory notes held by Guaranty Trust Co. of N. Y. Proceeds of the loan, which is not to exceed $26,000,000, are being used under an EPF contract for acquisition, construction and installation of additional plant facilities at the company's Middle River, Md., plant.

Latest Earnings Reports

Bohn Aluminum & Brass Corp.—Reports for nine months to Sept. 30 net profit of $1,148,690, or $3.26 each on 352,418 capital shares, against $1,005,737, or $2.85 year ago. Third quarter net was $331,603, or 94c a share, against $344,004, or 98c in preceding quarter, and $413,556, or $1.17 in 1940 period.

Square D. Co.—Reports for nine months to Sept. 30 net profit of $2,255,-876, equal after dividend on 5% preferred stock to $5.17 each on 421,360 common shares, against $1,263,002, or $2.82 a common share year ago.

Thompson Products Inc.—Reports for September quarter net profit of $341,584, equal after dividend on $5 cumulative convertible prior preference stock to $1.04 per common share, against $421,907, or $1.31 in June quarter and $560,802, or $1.78 in 1940 third quarter. Nine months net profit was $1,264,783, or $3.92 a common share, against $1,608,704, or $5.08 last year.

Ex-Cell-O Corp.—Reports for September quarter net profit, after provision for federal taxes, of $765,103, or $1.91 each on 398,806 common shares, against $485,581, or $1.22 on 397,306 shares last year. Nine months net profit was $1,853,811, or $4.65 a share, against $1,315,465, or $3.31 a year ago.

Aeronca Aircraft Corp.—Reports for eight months to Aug. 31 net income of $55,122 before federal income tax and provision for contingencies, on net sales of $1,038,387.

Kinner Motors Inc.—Reports for September quarter net profit of $57,554 after provision for federal taxes, equal to about 12.5c each on 445,978 capital shares, against $50,624, or 11c year ago. Sales for the three-month period totaled $553,552 against $272,407 in 1940 quarter. Company announced receipt of a "sizeable order" from Dutch East Indies for engines to power Ryan primary trainers.

Reynolds Metals Co. Inc.—Reports for nine months to Sept. 27 consolidated earnings before provision for income and excess profits taxes of $4,808,744, equal to $2.04 a common share, against $3,047,607, or $1.78 year ago. Third quarter consolidated earnings were $1,-441,687. Net profit after tax provisions was $756,287, or 67c a share after deduction for preferred dividend, against 63c in 1940 period.

American Airlines Inc.—Reports for nine months net income of $2,106,234 after depreciation, obsolescence, interest and $1,040,600 provision for federal income taxes, or $4.25 each on 50,000 cumulative convertible preferred shares and $3.38 each on 574,848 common shares. Net profit in similar 1940 period was $1,556,849 after federal taxes, or $4.30 each on 361,836 shares of capital stock then outstanding. Revenue passengers totaled 884,517 in first nine months against 631,700 in 1940 period; revenue passenger miles, 302,145,244 against 228,299,541.

Adel Precision Products Corp.—Report for first three months of fiscal year to Aug. 1 shows net income of $89,697 after charges and tax provisions or about 27.5c on 300,000 shares. Quarter deliveries were $902,273. Proforma balance sheet as of Aug. 31, after giving effect to new financing and adjustments, shows current assets, $1,155,940 ($315,564 cash), against total current liabilities of $958,596. Earned surplus was $298,150.

Current SEC Reports

Air Associates Inc.

Company reports that under terms of orders constituting about one half its present backlog of more than $5,000,000, deliveries totaling about $1,500,000 are now past due.

"Such delays are due to the rapid rate at which the company's business has grown and the difficulty of obtaining some essential materials on schedule," the company states. "While technically delayed orders in default are subject to cancellation, the company does not anticipate any substantial action of this kind because its products are generally of a highly specialized nature and if recorded elsewhere by present customers would be subject to as great, if not greater, delays in eventual delivery."

Northwest Airlines Inc.

Croll Hunter, president, has been granted option to purchase 10,000 no-par common shares, company reports. Options may be exercised on or before Jan. 1, 1945, at $14 per share at the rate of 2,000 shares each calendar year starting with 1941. The option is terminable at the will of the company, except to the extent it has accrued at termination and in such case it must be exercised within six months. It was granted as a partial consideration for services rendered.

Salaries in the fiscal year ended June 30 were: Hunter, $23,000; George E. Gardner, vice-president, $14,800; and E. I. Whyatt, secretary, treasurer, $12,-400.

The firm reports that during the fiscal year 447 shares of 5% cumulative preferred, $100-par, stock were converted into 4,470 shares of no-par common.

United Aircraft Corp.

Reports that of 50,000 shares set aside March 6, 1936, for purchase by officers and senior employes at not less than $15 per share the following were bought: 12,300 in 1936; 12,400 in 1937; 13,050 in 1938; 7,250 in 1939; and none in 1940, leaving 5,000 shares still under option.

Aviation Corp.

Reports borrowing of $531,697 under a 2½% promissory note to pay for equipment to be installed "in a plant producing aeronautical engine parts" under an EPF contract. The note was payable Nov. 1 and the funds were borrowed Sept. 2 from The Detroit Bank.

Dividends

Douglas Aircraft Co.—$5 payable Nov. 21 to stock of record Nov. 7. Previous payment was $5 on Nov. 20, 1940.

Eaton Manufacturing Co.—75c payable Nov. 25, of record Nov. 5. Company paid same amount Aug. 25.

U. S. Plywood Corp.—37½c on preferred shares, payable Nov. 29, of record Nov. 15.

Piper Aircraft Corp.—15c on convertible preferred shares, payable Dec. 1, of record Nov. 17.

Fairchild Engine, Airplane

Company reports that loan agreement with Bankers Trust Co., dated Jan. 6, 1941, has been amended to increase from $1,600,000 to $2,200,000 the amount which may be borrowed and to extend from Oct. 31, 1941, to April 30, 1942, date of maturity of loan. Loan is evidenced by 2% promissory notes.

Company also reports following increases as of Sept. 30 under loan agreements dated as follows: Nov. 20, 1940, from $823,000 to $920,000; Jan. 6, 1941, from $940,000 to $1,070,000; and Jan. 13, 1941, from $314,000 to $360,000. Under Nov. 20, 1940, agreement company may borrow up to $1,200,000 to pay for additional plant facilities at Fairchild Aviation Division, Hagerstown, Md.; under Jan. 6, 1941 agreement company may now borrow up to $2,200,000 for additional plant facilities at Ranger Aircraft Engines Division, Farmingdale, L. I.; and under Jan. 13, 1941, agreement company may borrow up to $450,000 for additional facilities at same plant.

Clue to Trading Trends

(Continued from page 40)

"source and use of funds" study of aircraft and aircraft parts companies, similar to that undertaken last year of other listed companies. As a part of the work, backlogs and contracts are being examined carefully.

Staff members said that the survey will show a rapidly increasing trend of work away from aircraft companies themselves to automobile firms. It is not expected that the study will be released for some time yet. Partially confirming this statement, the Automobile Manufacturers Association reports that aircraft orders to the automobile industry from Sept. 1, 1939, to Sept. 1, 1941, totaled $1,979,000,000, up approximately $500,000,000 since July 1. The figures include letters of intent, subcontracts and prime awards as well as orders to Allison Division of General Motors. Total defense orders to the automobile industry to Sept. 1, including motor vehicles, ordnance, etc., aggregated $3,530,000,000.

Aircraft shares on the Big Board showed a mixed trend during the past two weeks and trading was considerably quiter than in the preceding period. In the 25 aircraft issues studied, turnover was 320,240 shares as compared with 536,500 in the preceding two weeks. There was one less trading day in the latest period, however, as the market was closed election day, Nov. 4. Also, a large portion of the turnover in the preceding period was accounted for by Curtiss-Wright which was exceedingly active following a dividend declaration.

Price changes were mostly small, 12 issues showing advances, 11 declining and two unchanged. American Airlines showed a 3¼ point gain in the period despite a 2-point drop following the accident in Canada. Douglas Aircraft gained 2¼ on a turnover of 11,400 shares; company was awarded a $78,264,093 Air Corps order for planes and spare parts on Nov. 1. Lockheed, which got a $92,277,800 Air Corps order for planes and spare parts on Nov. 5, gained ¾ on 15,600 shares. Most active issue was Consolidated which lost 1 on 43,0000 shares.

Other active issues included: Aviation Corp. up ⅛, 31,400; Boeing Airplane, off ½, 19,300; Continental Motors, unchanged, 10,800; Curtiss-Wright, off ⅛, 39,000; Eastern Air Lines, off 1½, 11,300; Glenn L. Martin, off ⅜, 10,000; North American, off ½, 12,300; Pan American, off ¼, 24,000; United Airlines, up ⅛, 31,800; and United Aircraft, up ⅜, 12,200.

Trading on the Curb was about the same level as in the preceding period, 74,600 against 74,800 shares. Price changes were confined to fractions, except in one case, and of the 20 issues studied, nine showed gains, 10 were off and one was unchanged. Cessna Aircraft was by far the outstanding performer, accounting for more than 25% of total trading, 22,800 shares, and gaining 1¾. Activity followed publication of earnings estimate of around $5.50 a share for Sept. 30, fiscal year as compared with a net loss of $32,609 in preceding period.

Other fairly active issues included: Beech Aircraft, up ¼ on 8,000 shares; Brewster Aeronautical, off ⅜ on 6,000; Fairchild Engine & Airplane, off ¼ on 8,600; PCA, off ⅜ on 3,500; and Republic Aviation, up ¼ on 3,400.

Cessna Aircraft Shipments Total $3,000,000 Monthly

Cessna Aircraft Co. reports shipments are now totaling over $3,000,000 monthly and were approximately $14,000,000 during the past fiscal year. This compares with $431,437 in the 1940 fiscal year. Backlog is now about $30,000,000 and negotiations are reported under way for the largest order the company has yet received.

Net profit for the fiscal year ending Sept. 30 is estimated around $5.50 a share on each of 350,000 common shares outstanding. In the 1940 fiscal period the company had a net loss of $32,609.

Grumman Aircraft

Company reports sale of 27,000 shares of $1-par common stock and borrowing of $350,000 from Bankers Trust Co. The stock was sold between Jan. 1, 1940, and Sept. 20, 1940, through exercise of 54 Bearer Warrants, each calling for 500 shares; funds were borrowed between Nov. 11, 1940, and Dec. 31, 1940, to construct certain plant facilities under an EPF contract.

Aircraft Accessories Corp.

Company has filed an application for registration of its 50c-par common stock on the New York Curb Exchange. The amount to be registered is 407,215 shares and the amount to be registered upon notice of issuance is 290,000 shares. The stock is already listed on the Los Angeles and San Francisco Stock Exchanges.

Firm reports that 60,000 shares of $5-par cumulative convertible preferred stock were outstanding as of Sept. 30, against 37,010 shares on Aug. 31. Shares were offered to public at $9 each. Proceeds were used as follows: $86,000 cash in bank to be used as working capital; $50,700 invested in additional inventories; $59,500 invested in capital assets, such as heavy machinery; $40,000 for prepayment of taxes and for other deferred charges; and $186,000 used to pay current accounts and notes payable. Total proceeds to company are estimated at $459,000. Of proceeds, $7 of each share will be credited to stated capital and 20c to paid-in surplus.

Fairchild Aviation Corp.

Company has filed an application for registration of 10,000 additional shares of its $1-par common stock on the New York Curb Exchange. These shares are under option to James S. Ogsbury, president, at $4.50 a share to Dec. 31, 1945. He may not buy more than 2,000 shares in any year plus "any shares not previously purchased under the option."

Stockholders Meeting Set

Stockholders of Lockheed Aircraft Corp. and Vega Airplane Co. will vote on the proposed merger of the two concerns on Nov. 21.

Famous Airplanes, Solar Equipped - Fourth Advertisement of a series

American Aviation

EQUIPMENT NEWS

Airlines Urged to Cooperate on Equipment

By Pooling Time and Talent, Companies Could Reduce Servicing Forms and Agree on 'Matched' Items for Mutual Benefit

By E. J. FOLEY

MUCH attention is being given the allocation of airliners for the coming year and more, but the allocating of time and effort to a long range program of airline collaboration in equipment standardization continues to be a nonentity.

This criticism has been heard before, but that such a program has not been inaugurated along with the many other aviation advancements is somewhat mystifying, and the problem can stand a going over at this time.

Evidence keeps piling up to show that the airlines might, through a pooling of time and thought and talent, be able to reduce servicing forms and procedures to a common denominator, concentrate and simplify test procedures, acceptances and subsequent standards, and agree upon certain economical "matched" items of servicing equipment for their mutual benefit.

Obviously, under pressure of time and circumstances, the airlines have been forced to virtually lift themselves by their belts to new highs of carrying capacities—attained through maximum utilization of flying equipment, extreme vigilance in matters of operating safety, extensive and detailed training of all personnel, and the foresight of exceptionally capable management.

As a result, little time has been given to all the "luxury benefits" of cooperative effort. Under duress it has apparently seemed desirable for the airline to solve its own problems personally, even in the face of the realization that the same problem may already have been satisfactorily solved by another operator.

That a "dog-eat-dog" competitive policy has been the cause does not seem to stand up under scrutiny. Accelerated growth under public and governmental pressure just hasn't given key airline personnel a chance to integrate a plan of collaboration.

While our chief concern of the moment is the equipment field, one of the most obvious aspects of this problem is weight control. While pursuing further into the field of aircraft weight control (on which we expounded in these pages Oct. 15), we recently had occasion to study in detail an undergraduate thesis dealing with the problems of domestic airline weight and balance control prepared by Sherman E. Crites, then a student at M.I.T.

Included in his presentation were a number of sample forms employed by some dozen air transport operators for recording and controlling aircraft weight changes. And after a study of the forms had indicated the dozen or so prevailing forms for weight control, the observation led away from weight control, as such, to the more general subject of possible operating economies that might be realized through application of a coordinated program of airline cooperation.

For instance the transport aircraft in current use is a two-engine, low-wing, all metal unit restricted by choice to some two or three specific types. The question that follows is whether it is necessary that there be several different weight forms for an identical type of airplane. With due regard for

(Turn to page 49)

Ranger Engine Stars in Telecast

BRINGING AIRCRAFT engine manufacturing methods to the public through television, the Ranger in-line air cooled powerplant of Fairchild Engine and Airplane Corp. made its debut before the cameras of CBS recently in a 45 minute telecast. Four experts from the assembly line at Ranger assembled the engine from the point at which the last cylinder was installed to final timing and installation of a test club. Photo shows assembled engine as it appeared to the television audience.

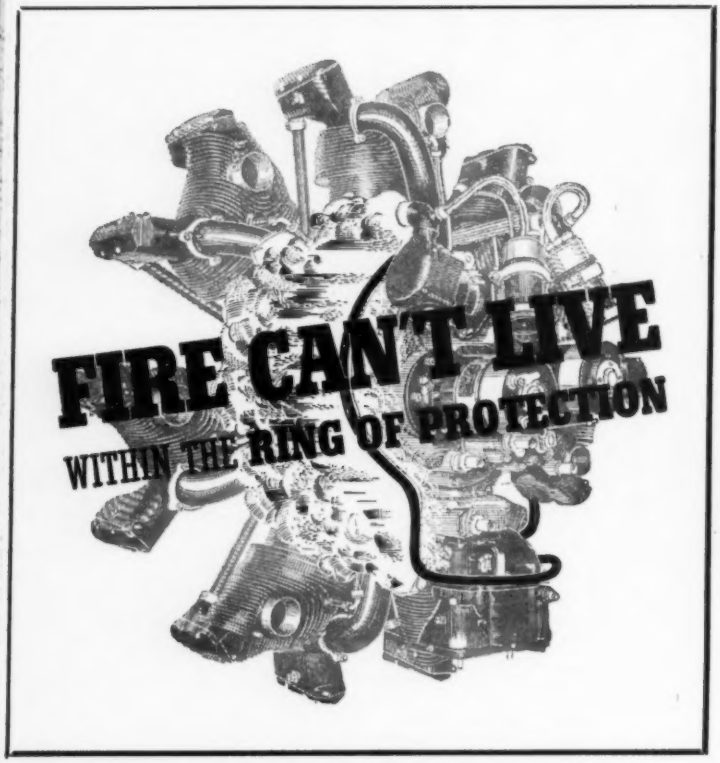
Goodrich Adds to Line of Synthetic Hoses

WITH THE addition of a new type hose for all standard paint and lacquer spraying equipment, with the tube built of Ameripol (a synthetic rubber), B. F. Goodrich Co., Akron, O., now has a full line of synthetic rubber-lined hoses from ¼" inside diameter to 10" inside diameter Type 400 oil hose.

The new line is made in inside diameters of ¼", 5/16", ⅜" and ½", all standard dimensions for paint spray equipment; the tube is of black, oil-resistant Ameripol.

In the ½" ID size, the construction is two-braid; in all other sizes it will be one braid of heavy, high-tensile cords. It is capable of being used as an airhose with ample margin of safety: working pressures for all sizes is 150 pounds maximum.

The new line replaces Goodrich's Lacquer hose and its Mainstay line of paint spray hose.



CAN you fight motor fires that occur in flight? Can you instantly detect an engine blaze? . . . kill fire in 3 or 4 seconds? *Sure you can!*

Airliners, U. S. Army and Navy fighting planes have the answer. A metal ring surrounds motor, blasts fire out of existence with carbon dioxide snow-and-gas. That's LUX protection.

By combining LUX Flame Detectors with Built-in LUX system you nail fire before it gets started. Visible or audible alarm gives warning.

Directional valves permit discharge of LUX gas into any motor of a multi-engined plane. There are LUX Built-in Systems for in-line engines as well as radial.

AIM . . .
SHOOT . . . KILL THE FIRE
New Pistol-grip Extinguisher for Cabin Protection
A lightweight fire-killer, engineered for airplane cabin use. Just aim Kidde-LUX extinguisher at fire, pull trigger and—zingo!—fire's out. No mess to clean up. No pumping with a Kidde-LUX. It's the market's neatest fire-fighter.

Have you seen "White Magic"? It describes LUX Built-in fire protection for planes. Your copy is free. Send for it.

LUX

Walter Kidde & Company
INCORPORATED
1339 WEST STREET, BLOOMFIELD, N. J.

Sinclair Designs Airport Truck For High Speed Oil Servicing

THE SINCLAIR Aircraft Oil Truck, now in use by American Airlines at La Guardia Field, New York, is pictured above and is the oil company's designers' answer to the need for a specially designed streamlined unit with motorized equipment for oil draining and refilling. The truck is built around a Ford underslung chassis so that it can operate in and around a crowded hangar, maneuvering about under the wings of the aircraft. Another reason for the particular design is that for oil servicing outside of the hangar, the truck may be positioned directly under the nose of the airplane, and the approach can be made from the front where the truck driver will have a full view.

Carried in the truck are one 300-gallon tank for new oil and one 250-gallon tank for used oil. Motorized pumps permit the simultaneous refilling and draining of two tanks. It is claimed that these operations can be performed by one man in about one-fourth of the time formerly taken by several men to do the job with old-type facilities.

Hoses and nozzles from both tanks are mounted on reels submerged into the front fenders. All pumps, meters and working apparatus are concealed but the operator is advised of the quantity of new oil delivered by a signal bell which can be set for any number of gallons. The tabulating meter shows the amount of new oil and drained oil in the tanks and is enclosed with its necessary indicators.

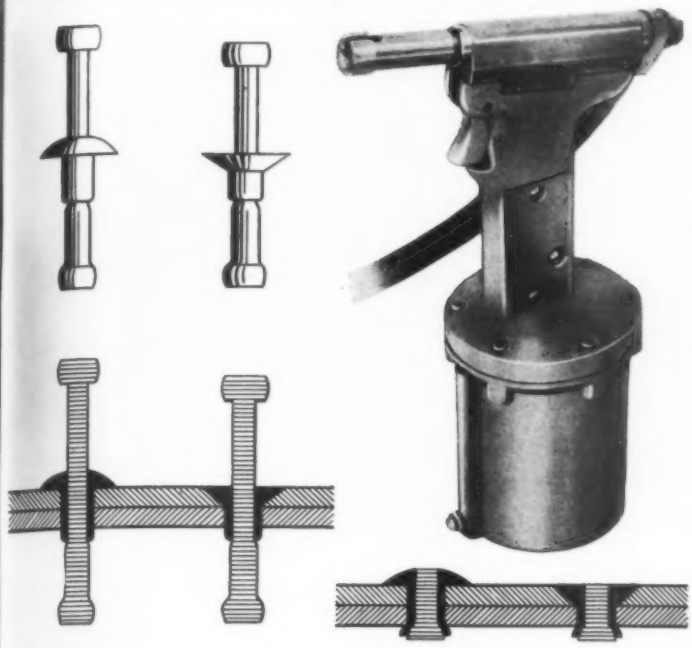
Square D Develops Circuit Breaker and Switch Combination for Aircraft

SHOWN HERE is a recent development for circuit protection on aircraft: it is a combination of circuit breaker and off-on switch. Titled, Class 9300 Circuit Breaker, it is available in a variety of sizes: 10, 15, 20, 25, 35 and 50 amperes. All sizes and capacities are offered in the same case, 2⅞ inches long by 1⅜ inches deep and ¾ inch wide. This is identical in size with the standard on-off switch with which the circuit breaker is completely interchangeable. Mounting centers are 1⅛ inches using 6-32 self lock-threads.

This small unit is said to save space, weight and wiring time. It eliminates fuses and provides calibrated protection for each circuit, all within the sealed housing. For on-off operation, the toggle lever is moved manually as with an ordinary switch. If dangerous over-current is present, the toggle snaps to the off-position. To reset, the toggle must be moved to the on-position. The 9300 Circuit Breaker is non-trip free [contact may be manually held closed for emergency] but when manually released, breaker will trip if over-current condition still exists.

The switch and circuit breaker combination is manufactured by Regulator Division, Square D Co., 6060 Rivard St., Detroit, Mich., and has the approval of U. S. Army Air Corps, Wright Field and the Navy Dept. Bureau of Aeronautics for non-trip free requirements.

Cherry Rivets Solve Blind Riveting Problem in Aircraft Construction



THE ILLUSTRATIONS above show the installation steps and the installation tool for Cherry rivets. Essentially these rivets, as pictured, are said to solve the problem of blind riveting so often encountered in aircraft construction and to eliminate the necessity for extensive engineering required to avoid the inclusion of blind spots which cannot be touched by the conventional hammer and bucking bar method of riveting.

The picture shows the self-plugging Cherry rivet, which has a mandrel with an expanded section and a head on the blind side. In installation, the assembly is inserted into the rivet hole until the head of the hollow rivet takes its ordinary position relative to the material being joined. Through the use of the combination hydraulic and pneumatic gun, upper right illustration, the expanded section on the blind side is pulled into the hollow body of the rivet, expands the shank and forms a tulip head in the back. The outside end breaks off during application and can be trimmed off with ordinary nippers. Aircraft factory tests are said to have indicated that one man unskilled can install and trim 540 Cherry rivets per hour.

The outstanding feature claimed for the part is its positive mechanical action. The force required to apply the rivet breaks the mandrel, accomplishes two results: it creates a clinching action, holding the two sheets together securely, and also it expands the rivet, causing the necessary pressure fit of the shank.

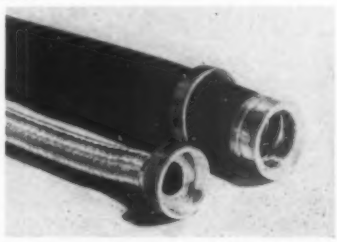
The manufacturer, Cherry Rivet Co., Los Angeles, claims that strength and resistance to fatigue of these rivets compare favorably with conventional solid rivets.

Amerflex Saves Weight In Aero Wiring Systems

AMERFLEX is the trade name of a new flexible electrical conduit for use in aircraft wiring systems, available without covering or with a synthetic rubber casing as shown here. It is claimed that this conduit, encased in synthetic, because of greater flexibility, heat resistance and oil and solvent resistance, will outlast ordinary conduit by 30 to 40%, and more than this, it is 47 to 54% lighter in weight.

It is specifically adaptable for use behind instrument panels, in nacelles and wherever throughout the aircraft, wiring might be exposed to external dirt and grease or mishandling. Where such protection is not required to such a degree, the flex conduit without the covering may be applied. Amerflex has been approved by the U. S. Army Air Corps and meets the specification AN-WW-C-561A Type No. 2 conduit.

It may be obtained in lengths up to 25 feet, with or without end fittings from Searle Aero Industries Inc., Hawthorne, Cal., the designer, developer and manufacturer of the line.



Longer Life Claimed for New Aero Spark Plug

A MATERIAL, chemically comparable to a precious stone and second only to the diamond in hardness, forms the insulator of a new aviation spark plug now being mass-produced for the U. S. air forces and aircraft engine manufacturers.

Chief features of the new plug insulator are said to be its resistance to the harmful effects of lead in the high-octane aviation fuels and its ability to withstand high heat and high compressions. Tests indicate that the insulator adds appreciably to the life of the plug, reducing plug maintenance and replacement costs and increasing availability of aircraft.

Research engineers are said to have spent 10 years perfecting the machinery and technique for manufacturing the plug. The basic material for the insulator is aluminum oxide; it is mixed with a binder and molded to shape under pressure and heat. Then for a period of hours, it passes through a butane-fired kiln hotter than any commercial tunnel kiln ever used before. When it emerges with the binder burned away, it will scratch any substance but the diamond.

The plugs are being made by the AC Spark Plug Division of General Motors Corp., Flint, Mich.

Ameripol Sponge Rubber Is Oil Resistant

TO FILL requirements of a wide range of applications where oil, grease or other solvents which deteriorate natural rubber are present, a new sponge rubber has been developed utilizing the synthetic, Ameripol. Tests of an extensive nature have indicated that Ameripol has extraordinary resistance to oils, greases and many other solvents as well as a higher degree of temperature resistance than natural rubber.

The new Ameripol sponge is in the same manufacturing classification as milled sponge made from natural rubber. Sodium bicarbonate or a similar blowing agent is turned into gas by the heat of vulcanization and thus produces a cellular structure.

This Ameripol sponge is a development of the B. F. Goodrich Co., Akron, O.

Westinghouse Electric and Manufacturing Co., Dept. 7-N-20, is mailing the following literature: Bulletin B-2287 describes distribution transformers up to 500 kva made of Hipersil, the newly developed silicon steel. Catalog section 26-630 describes Flex-Arc welding cable for work leads and electrode holders. For use in industrial plants and power stations, radial and secondary network distribution systems are described in a new 77-page book, B-2306.

COUNT ON TWA'S UNEQUALLED SCHEDULES, city to city and coast to coast. Flying the Route of the Stratoliners, it's only 13 hours, 40 minutes from Los Angeles to New York, 3 hours, 33 minutes from Chicago to New York, little more than 2 hours from Kansas City to Chicago—schedules that make every minute mean more.

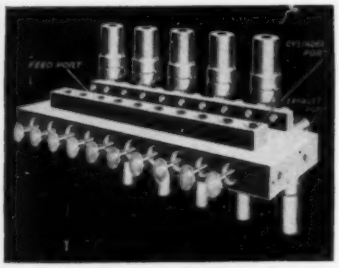
Transcontinental & Western Air, Inc.
10 Richards Road, Kansas City, Missouri

ROUTE OF THE STRATOLINERS TWA The TRANSCONTINENTAL Airline

Ten-Gun Hydraulic Charging Valve Shown

TO SIMPLIFY the combat crew's task of charging machine guns, a new hydraulic valve unit has been announced which permits the charging of 10 guns individually or simultaneously. Designated B-10-C and illustrated below, the unit has an electrically energized automatic mechanism for returning the valve to neutral position.

Because it takes the place of 10 separate gun-charging valves, it reduces, according to the manufacturer, by 60% the amount of tubing, connections and fittings required. Variations can be furnished to handle any desired number of guns. The 10-gun unit weighs less than 16 pounds and requires only a simple one-half inch pull of the proper valve stem to operate the desired cylinder. The valve is latched until charging is complete and then the automatic device returns the valve to neutral. In case of electrical failure, each unit can be operated manually, without any interference from the automatic or latching mechanisms.



The valve will operate from —40° F. to above + 200° F. without seizure. Being fully balanced, it requires only three or four pounds to operate over and above the force required to overcome the centering spring. Normal operating pressures can be up to 1500 pounds per sq. in.; test pressures are carried up to 4000 pounds per sq. in.

Fleetwings Inc., Bristol, Pa., is the manufacturer.

Ameripol Available For Seals Packings

SOME typical Ameripol oil seals and packings have been approved after tests by aviation authorities and are now in production. This new synthetic rubber has been compounded in accordance with a new formula which makes it an ideal molding compound for oil seals, v-type packings, accumulator diaphragms, etc. The material is particularly noted for its 50°C. resistance to temperature, exceptionally low oil absorption, low friction, ease of fabrication to close tolerances and high resistance to metal corrosion, heat, light and ozone.

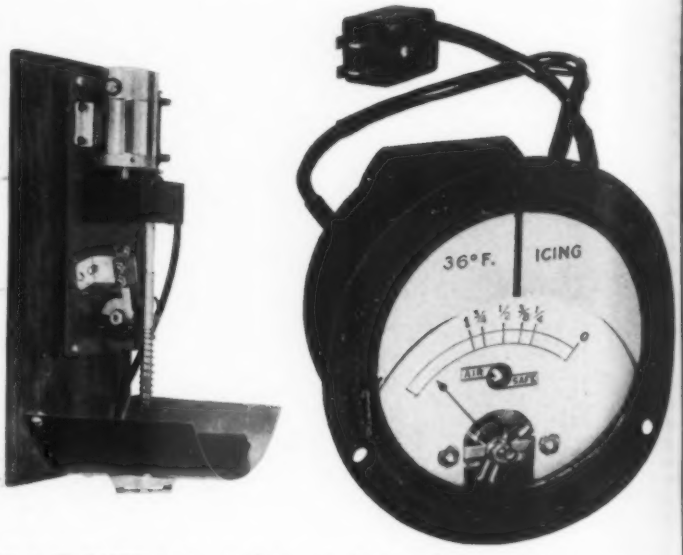
Full particulars including comparative test data and physical properties of rubber products made from this Ameripol compound for use on aircraft hydraulic systems will be sent by Miller Rubber Co., Akron, O., upon request.

Need a Washington correspondent these busy days? For only $15 a month?

Subscribe to American Aviation Daily for overnight news dispatches . . . plus use of Service Bureau for special information.

American Aviation Daily
American Bldg.
Washington, D. C.

Meter Safety Device Warns Pilot of Forming Ice and Tells Thickness



"AIR-SAFE" is the trade name of a new ice-accretion meter, which indicates the formation of ice on any part of the aircraft on which it may be located and also gives the thickness of the ice. Intended to present a solution to the present problem of "guesstimation" of ice presence and thickness on the leading edge of wings and other critical regions, "Air-Safe" is made up of an indicator and transmitter as shown here and the whole installation weighs less than three pounds. The exposed part of the device, installed on the nose or leading edge, takes up a space two inches in diameter and one-half inch deep.

The meter operates only when the ship is in 36°F. air and consumes only 12 watts of power when on. The instrument shows a pin-point of yellow light when it goes into action at 36°F. and a pin-point of red light when the ice begins to form. It is said that a film of ice no thicker than a cigarette paper will be positively indicated. The hand on the indicator dial shows the buildup of ice from ¼" to 2" in ¼" increments. If desired, the device can be made automatic, to turn on the de-icer equipment at any given depth of ice.

It is said that airline pilots, U. S. Navy and NACA representatives who have seen the unit are enthusiastic about its possibilities. "Air-Safe" is manufactured by G. L. Holzapfel Manufacturing Co. of Los Angeles.

A Private Owner Hangar for $325

A NEW steel frame hangar, canvas covered, has been designed by Steel Frame Airplane Hangars, 10218 W. McNichols Road, Detroit, Mich., to give the private owner and operator an economical, safe, and individual hangar at low cost ($325). The manufacturers claim that the carefully designed portable hangar is capable of withstanding practically all kinds of weather and winds of gale velocity.

The frame is made of heavy steel tubing, welded for durability. The main truss section is a welded bridge type. Roof is of 15-ounce canvas, and the door is a drop curtain quickly and easily opened or closed.

The canvas covering can be treated with a fire-resistant solution for $25 additional cost. Extra equipment includes a windsock for $10, special color schemes, and special designs painted on the canvas.

Airlines Urged to Pool Time, Talent

(Continued from page 45)

the differences in loading and operating techniques which exist, it does appear that more consideration could be given these weight control divergences and to standardization on the summation of the best features of all, using but a single form for the single job.

This same treatment might be given component parts' service periods and servicing forms. Operating factors being nearly equal, as they would seem to be in the domestic airlines, the question arises as to whether, exaggerating one example, one operator should trust his altimeters for 75 hours between overhauls while another operator using the same instruments over practically the same route in the same type of aircraft should trust his altimeters for 500 hours. Cooperation might permit the logical determination of a sound mean basis for these times which would be applicable to an entire group of operators.

Accessories Field

As for the field of aircraft accessories, gadgets and maintenance materials, it does seem reasonable that a consulting body of maintenance representatives of at least the major airlines could meet and pool their idea on such equipment. Aircraft manufacturers are participating in pooling programs under stress of the defense effort to their mutual benefit.

Let us consider a mythical firm that may be making a propeller, gyro-compass, anti-icer pump, windshield wiper, anti-corrosive agent or general purpose cement. Hoping to sell the airlines, the owner sits down and writes a technical sales letter to them all, knowing that they are all within shouting distance of one another at the same airport.

Perhaps three or more lines accept his proferred offer of a test-consignment shipment. Engineering and maintenance staffs of the several operators involved then prepare exhaustive test programs to assure the data required for acceptance and they may even allocate an airplane for the purpose, if need be. It is not out of reason to imagine that all of the operators inaugurate their tests on the same day.

Outcome Immaterial

Whether acceptance or rejection of the article tested is the outcome is immaterial. The obvious fact is that nearly three times the necessary work was done and possibly none of the testing agencies prepared the most comprehensive program or procured the most conclusive results possible because of a lack of appreciation of some small factor involved.

It may well be that a joint consideration of the item under test, by all parties concerned, would have produced a more useful, fairer report, tempered with the ideas and experiences of all. The time required for the program could have been reduced by one-half, even allowing for the "dickering" that would be unavoidable.

Incidentally, had our mythical firm not been required to supply several test specimens and then stand by for all the scores to come in, he might have been willing, if supported by general preliminary acceptance, to proceed post haste with the possible expensive revision to his line for the particular application and thus have made the innovation available at an earlier date.

AVIATION CADETS at Randolph Field, Tex., will now learn more flying safety and precision than ever as a result of classroom "cockpits" like this one. Huge wall-panels, built to scale and hand-controlled, now can teach 20 or more men instead of one—and do it better. Technical Sgt. Eugene J. Baldauf shows tomorrow's pilots how their BT-14 instruments should read for best results.

Future Trend

We have mentioned the similarities of the current airliner. Looking ahead, it appears that the trend is toward four-engined craft. During the period of violent growth of transport activity and even up to very recent dates, it was necessary that servicing equipment such as engine hoists, engine build-up or servicing stands, inspection scaffolds, entrance ladders, etc., be built right on the spot by the operator, in order that they might fit the particular job.

By pooling their ideas, airline maintenance men could originate basic, simple design requirements for key units and all standardize on one piece of equipment to meet each need. Through quantity production and purchasing of such matched sets of equipment (presumably to be manufactured by an outside concern specializing in this type of work), we feel that the operators could realize appreciable economies by all doing the same job on the same type of plane with the same tools.

Practicability Proved

That such simplification is practical has already been indicated by one manufacturer—Whiting Corp. of Harvey, Ill.—now making several such items for airline use. It is of interest to note that, in at least one item of this firm's equipment, design cooperation of a domestic operator—Northwest Airlines—was utilized. This is only one of several scattered examples of collaboration along these lines, and it appears to indicate the need for and interest in such a project.

Now, all of the considerations on airline cooperation represent a long range program, for which there are, admittedly, some valid objections, but none which should be insurmountable to an industry which has consistently done the "impossible."

In passing, it is worth mention that in dealing with these problems government agencies might be inclined to desire adoption of the standards of the service forces of the nation as criteria for judgment of air transport operation. It is our thought that the nature and scope of military operation differs so much from commercial work as to make military standards not necessarily unreasonable or unfair to the operator, but at least unreal. If some more concrete, factual airline standards were available, they might offer a logical solution to this problem.

Method Suggested

As for accomplishing greater standardization, it might be that a joint effort could be initiated and integrated through committees of an organization such as the Air Transport Association. It would appear that the economies available through such a medium would warrant the serious consideration of operators even to the extent of joint financing any organization, test laboratory or even test aircraft that might be needed.

It doesn't seem too visionary to anticipate an air transport version of the "Good Housekeeping Seal of Approval," pending such cooperative activity.

Industry Safety Mark Set

Nashville Division of Vultee Aircraft Inc. last month laid claim to being the first aircraft company in the history of the industry to work 1,000,000 consecutive man-hours without a single lost time accident.

Power Unit Permits Testing of Motors

THE B-L portable power rectifier recently marketed provides a flexible source of D-C power supply which may be utilized in testing various types of motors as applied to the operation of wing flaps and landing gear retraction. Developed in cooperation with aviation production and test experts, this unit can also be for airplane engine starting where the requirements do not exceed 12 volts at 300 amperes or 24 volts at 150 amperes.

In this power unit, there is a three center-tapped heavy duty transformer, six separate stacks of copper oxide dry plate rectifiers, thermo switch controlled by the plate temperature of the rectifier element. This protector switch disconnects the alternating input by opening a three pole main relay upon overload.

Designed and manufactured by the Benwood Linze Co., St. Louis, Mo., for 190 to 250 volts, 60 cycle, three phase input, specific output requirements may be made to meet customers' needs.

G-E Arc Welder for Thin-Gage, Aero Work

ILLUSTRATED below is the Strikeasy, a new 150 ampere, dc arc welder for use in fabricating bright-surfaced, thin-gage metals such as aircraft tubing (4130) with a wall thickness of 35 mils. Most important of the features of the unit is its extra high instanteous recovery of voltage (40 to 60 volts) which helps the operator to strike the arc with ease under the difficulties presented by bright metals in thin gages.

Rapid adjustment of the current is available through the use of a tap switch and rheostat; the former for speed in getting wide range adjustments and the latter for accuracy in obtaining the exact number of amps required for the best results. The wide range of the piece of equipment permits the use of shielded arc electrodes from 3/16" diameter to 3/64" diameter.

The equipment is horizontally mounted to give good lubrication qualities and to avoid excessive thrust on the self-sealed ball bearings. A fan cooling system and isothermic relays guard against heat and overloads. When supplied

with running gear, which is optional, the overall dimensions are: length, 40"; width 16" and height, 27"; weight of the assembly is 415 pounds net.

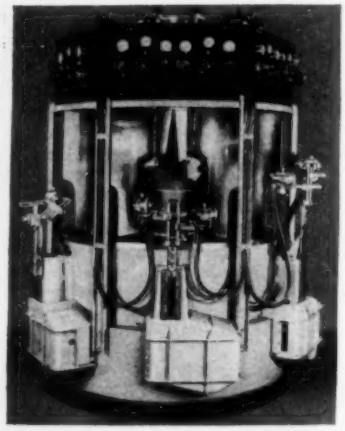
General Electric Co., Schenectady, N. Y., is the manufacturer.

Metallizing Machine Speeds Up Output of Engine Cylinders

THE NEW automatic metallizing machine, illustrated below, eliminates many hand spraying operations formerly required for aircraft engine cylinders and is said to provide consistently accurate coatings of uniform thickness.

Recently installed by Pratt & Whitney, Wright Aeronautical, Buick, Studebaker and other large engine manufacturers, for the spraying of aluminum and other corrosion resistant metals on the cylinders of air cooled aircraft engines, the machine is capable of turning out from 30 to 40 complete cylinder assemblies per hour.

The machine comprises six individual stations—each controlled by reducing gears and fully adjustable to various motions and speeds. Cylinders are loaded at Station 1 and then indexed to Stations 2, 3, 4, 5 where the metal coatings are automatically applied to different sections of the cylinder surface. Station 6, the final step in the cycle, is for inspection and unloading.



The unit has been developed and manufactured by U. S. Galvanizing and Plating Equipment Corp., Brooklyn, N. Y., in collaboration with Metallizing Engineering Co. Inc., Long Island City, N. Y., whose METCO Controlled Power Metallizing Guns and accessories are used throughout.

Plastic Mast Base For RAF's Airacobras

TOP AWARD winner in the communications classification of the 6th Annual Modern Plastics Competition is the molded plastic aerial mast, shown here. Used in the RAF version of the Bell Airacobra and designed therefore to stand speeds in excess of 400 miles per hour in all weather conditions, the mast design presented the problem of meeting the excellent dielectric properties needed to assure the highest efficiency in transmission and reception of signals.

The base was produced by the plastic division of Erie Resistor Corp., Erie, Pa., which reduced the weight of the unit to a minimum by coring out a large portion of the base and vertical riser to give a strong, hollow section. The material used is Monsanto's polystyrene, Lustron, said to be the lightest of all plastics; its electrical insulation properties and its uniformity of strength under all weather conditions encountered in flight were contributing factors in the choice of it for this application.

Allen Firm Announces Fast Battery Charger

THE ALLEN F-100 Fast Battery Charger, pictured below, is guaranteed for 24 months and through the use of twin Magnesium-Cupric-Sulphide dry rectifiers, each 50 ampere type, provides full 100 ampere capacity. A 30-minute time clock, in the circuit only when charging at a fast rate, permits controlling of the charge to the desired time limit.

The unit is supplied with built-in tester with "load" and "plate selector" switches to provide the proper test for any battery. The rectifying units and transformer are kept cool by means of two motors equipped with rotary fans and a ventilating grill at the back of the unit assures circulation. The unit is mounted on large rubber tired casters for portability and a wheeling handle is provided at the rear.

The manufacturer is Allen Electric and Equipment Co., 2101-2117 N. Pitcher St., Kalamazoo, Mich.

High-Speed Band Saw Boasts New Features

BOICE-CRANE Co., 1730 Norwood Ave., Toledo, O., has begun production and is making shipments on a new 14-inch band saw that incorporates several new features. The manufacturer gives the following data on the saw: wheels, 14 inch diameter; maximum depth of cut, 8⅝ inches; depth of throat, 13½ inches which will permit cuts to the center of 27-inch diameter work, tilting work table, 15 inches by 15½ inches; height, 67 inches.

Three distinct claims are made by the manufacturer: (1) that it cuts from 2 to 4 times faster than similar machines of the same and larger size, (2) that it cuts at least twice as smooth on wood and fiber materials, (3) that a new welded steel frame gives this machine a new standard of rigidity that has never been equalled in any similar machine. Basis for these claims is the several original features, which include light weight wheels, pressure molded of Bakelite, claimed to be the first such application for plastics. Faster and smoother cutting is said to be the result of the possibility of operating the wheels at higher speeds.

The modern functional design of this machine came from the boards of Harold Van Doren and Associates, well known industrial designers.

Single speed, 1200 rpm, models with direct connected motors, V-belt drive, bench models and a special model equipped with selective speed gear box giving eight speeds from 1120 to 25 rpms are available for standard or special applications.

Punching, Riveting Unit For Continuous Output

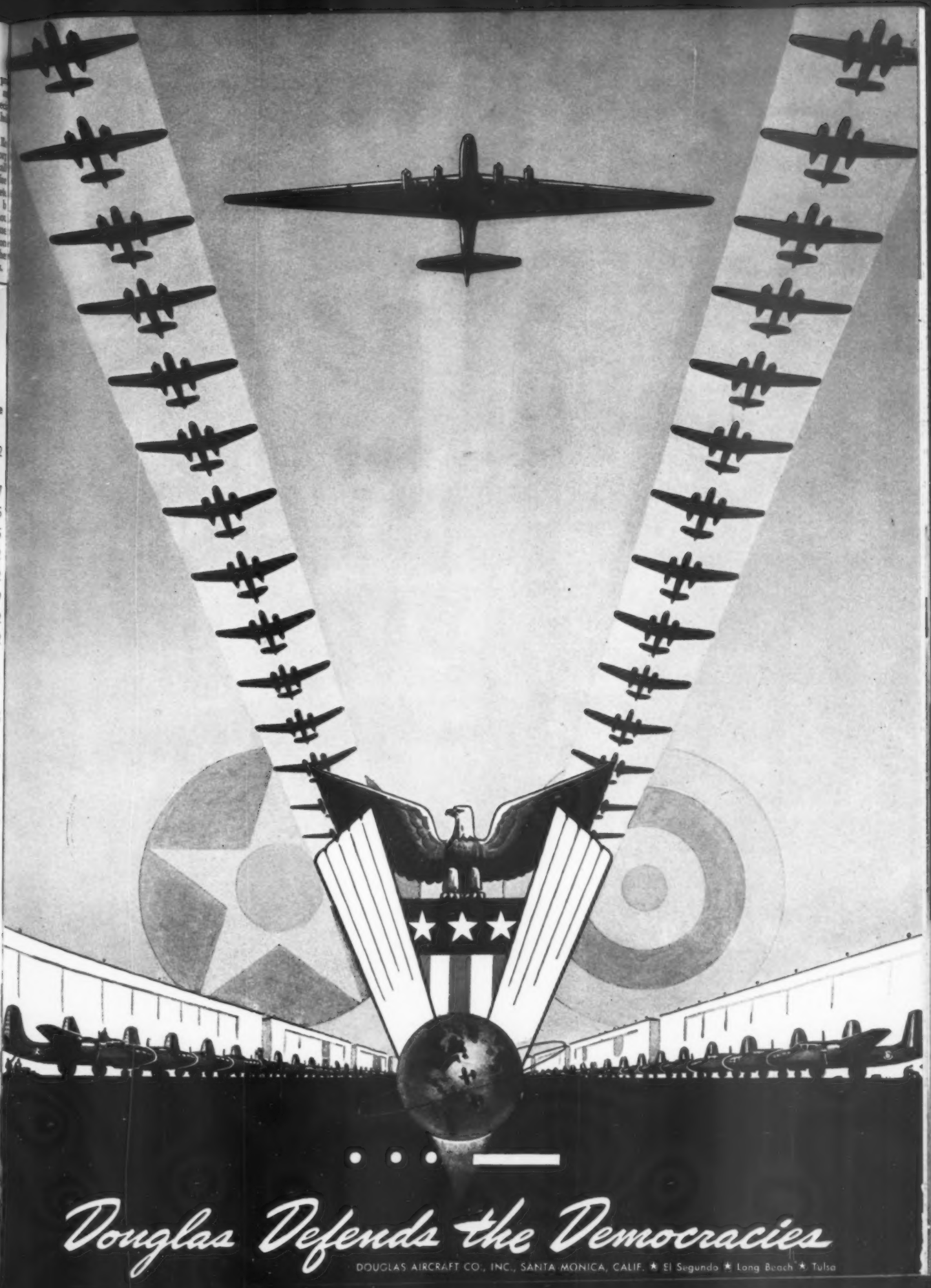
A NEW Model 1002 Riveter has a 48" throat "C" frame and is regularly equipped with an air operated remote control and quick-drop anvil support operated by the same control unit. This anvil support permits a 4½" opening in the punching and riveting head for feeding and removing deep channel sections and the like.

The remote control can be placed in any position or location to provide more convenient handling of riveting of large sections. A spot "spotlight" indicates where the hole is to be punched.

This machine, a product of Engineering and Research Corp., Riverdale, Md., will automatically punch and countersink holes, feed and head rivets up to ⅞" diameter in one continuous operation by depressing two foot pedals without shifting material, five to 10 times faster than the combined operations can be performed by any other methods, the manufacturer states.

Advertisers In this Issue

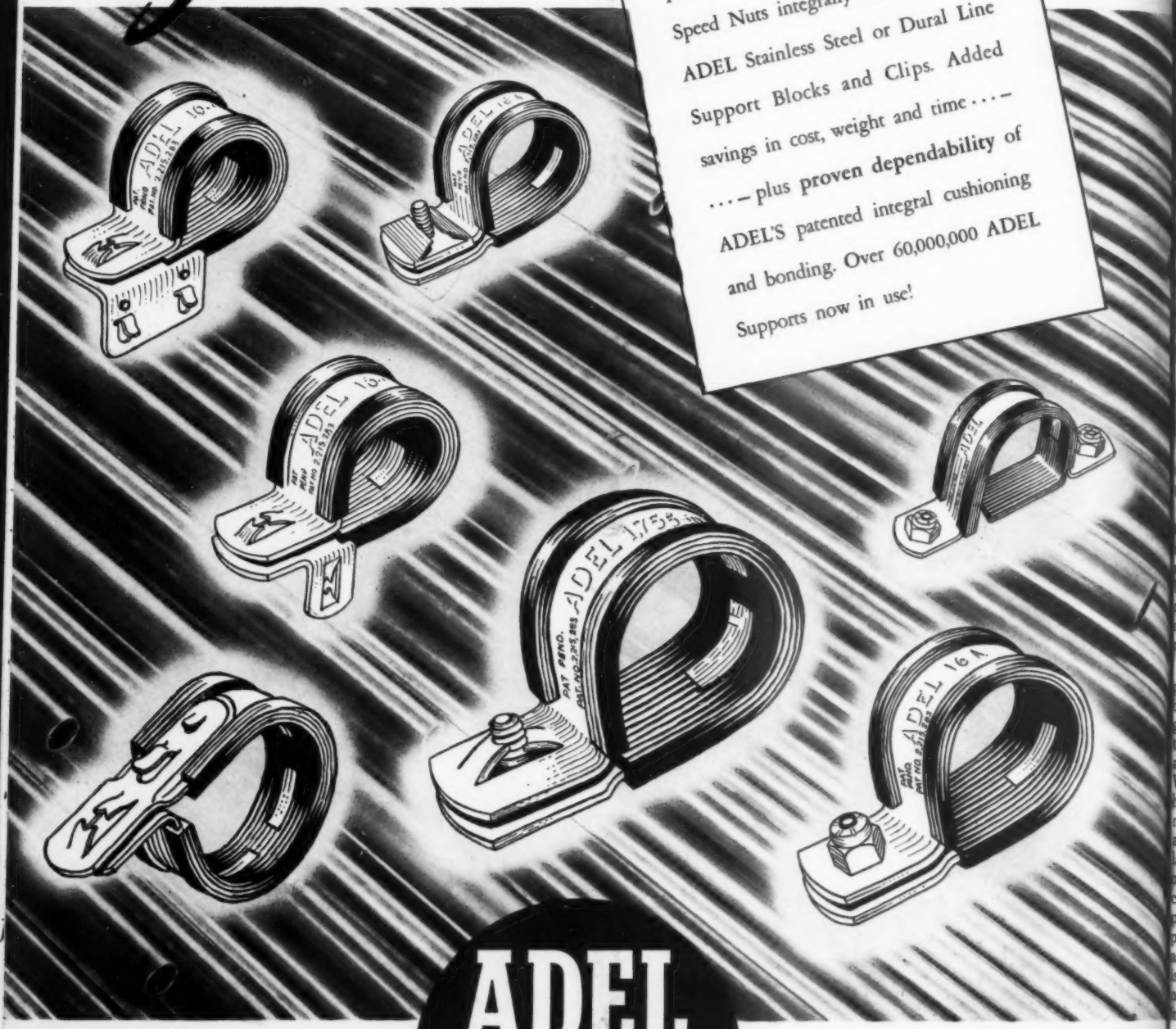
Company	Page
Adel Precision Products Corp.	52
Aero Industries Technical Institute	37
Aircraft Components	35
American Airlines	5
Beech Aircraft Corp.	22
B. G. Corp.	32
Bell Aircraft Corp.	29
Braniff Airways	32
Crescent Panel Co.	42
Curtiss-Wright Airplane Division	41
Curtiss Wright Technical Institute	25
Douglas Aircraft Co.	51
Elastic Stop Nut Corp.	37
Goodyear Aircraft Corp.	10
Gulf Oil Corp.	20
Jacobs Aircraft Engine Co.	26
Kidde & Co., Walter	46
Martin Co., Glenn L.	31
Pioneer Instrument Division	33
Pump Engineering Service Corp.	2
Ranger Aircraft Engines	17
Solar Aircraft Co.	44
Suncook Mills	32
TWA Inc.	47
United Air Lines	27
Western Electric Co. —Electrical Research Products Division	34
Wright Aeronautical Corp.	7


Douglas Defends the Democracies
DOUGLAS AIRCRAFT CO., INC., SANTA MONICA, CALIF. ★ El Segundo ★ Long Beach ★ Tulsa

JUST A REMINDER···—

It pays to get in a jam!

ADEL *Design Simplicity* furnishes fool-proof "jam" with Elastic Stop Nuts or Speed Nuts integrally incorporated in ADEL Stainless Steel or Dural Line Support Blocks and Clips. Added savings in cost, weight and time···— ···— plus **proven dependability** of ADEL'S patented integral cushioning and bonding. Over 60,000,000 ADEL Supports now in use!



ADEL

Manufactured under U. S. Letters Patent Nos. 2,215,283, 2,227,528; other U. S. and Foreign Patents Pending.

Eastern Sales Engineer
J. HENRY REISNER
Hagerstown, Maryland

PRECISION PRODUCTS CORP.

10777 VAN OWEN ST., BURBANK, CALIFORNIA